

QLA4010/4010C User's Guide

1-Gb iSCSI to PCI-X Host Bus Adapters

Information furnished in this manual is believed to be accurate and reliable. However, QLogic Corporation assumes no responsibility for its use, nor for any infringements of patents or other rights of third parties which may result from its use. QLogic Corporation reserves the right to change product specifications at any time without notice. Applications described in this document for any of these products are for illustrative purposes only. QLogic Corporation makes no representation nor warranty that such applications are suitable for the specified use without further testing or modification. QLogic Corporation assumes no responsibility for any errors that may appear in this document.

No part of this document may be copied nor reproduced by any means, nor translated nor transmitted to any magnetic medium without the express written consent of QLogic Corporation.

■ Adobe and Acrobat are registered trademarks of Adobe Systems, Inc.

Linux is a registered trademark of Linus Torvalds.

■ Microsoft and Windows 2000 are registered trademarks of Microsoft Corporation.

QLogic is a registered trademark of QLogic Corporation.

Red Hat and all Red Hat-based trademarks are trademarks or registered trademarks of Red Hat, Inc.

All other brand and product names are trademarks or registered trademarks of their respective owners.

Document Revision History
Draft 7, 12/6/03

© 2002–2003 QLogic Corporation. All rights reserved worldwide.
First Printed: December 2002
Printed in U.S.A.

QLogic Corporation, 26500 Aliso Viejo Parkway, Aliso Viejo, CA 92656, (800) 662-4471 or (949) 389-6000

Table of Contents

Section 1	Introduction	
1.1	How to Use this Guide	1-1
1.2	General Description	1-1
1.3	Features	1-2
1.4	Technical Support	1-2
1.4.1	Availability	1-2
1.4.2	Training	1-2
1.4.3	Contact Information	1-3
Part I	Hardware	
Section 2	QLA4010/4010C	
2.1	Installation in the Computer	2-1
2.2	Specifications	2-3
2.3	Label	2-3
2.4	Agency Certification	2-3
Part II	Software	
Section 3	Windows 2000 Driver Installation	
3.1	Supported Features	3-1
3.2	Driver Files	3-1
3.3	Creating the Driver Disk (Optional)	3-1
3.4	Installing the Driver	3-2
3.4.1	Initial OS Installation with the QLA4010/4010C HBA as an Add-On Device	3-2
3.4.2	Adding the QLA4010/4010C HBA to the Existing OS	3-3
3.4.3	Updating the Existing Driver	3-4
3.5	Removing the Driver	3-5
Section 4	Windows Server 2003 Driver Installation	
4.1	Supported Features	4-1
4.2	Driver Files	4-1
4.3	Creating the Driver Disk (Optional)	4-1
4.4	Installing the Driver	4-2
4.4.1	Initial OS Installation with the QLA4010/4010C HBA as an Add-On Device	4-2

4.4.2	Adding the QLA4010/4010C HBA to the Existing OS	4-3
4.4.3	Updating the Existing Driver	4-4
4.5	Removing the Driver	4-5

Section 5 Red Hat Linux Driver Installation

5.1	Introduction	5-1
5.2	Creating the Driver Floppy Disk	5-1
5.3	Installing the Driver	5-1
5.3.1	Building a Uniprocessor (UP) Version of the Driver	5-2
5.3.2	Building a Symmetric Multiprocessor (SMP) Version of the Driver	5-3
5.3.3	Loading the Driver Manually	5-4
5.3.4	Building a RAMDISK Image to Load the Driver Automatically	5-4
5.3.5	Building a Custom Kernel with the QLogic Driver	5-6
5.3.5.1	Prerequisites	5-6
5.3.5.2	Building a Custom Kernel to Load the Driver	5-6
5.4	System Driver Parameter max_scsi_luns	5-9
5.5	Driver Command Line Parameters	5-10
5.6	Proc Filesystem Support	5-10

Part III Applications

Section 6 SANsurfer Control iX

6.1	Introduction	6-1
6.2	Installing SANsurfer Control iX	6-1
6.2.1	Initial Installation	6-1
6.2.2	Uninstalling SANsurfer Control iX	6-5
6.2.2.1	Windows 2000	6-5
6.2.2.2	Red Hat Linux	6-5
6.3	Getting Started	6-6
6.3.1	Starting SANsurfer Control iX	6-6
6.3.1.1	Starting SANsurfer Control iX on Windows 2000	6-6
6.3.1.2	Starting SANsurfer Control iX on Red Hat Linux	6-7
6.3.2	Main Window and Window Navigation	6-7
6.3.2.1	Host Tabbed Page	6-12
6.3.2.2	HBA Tabbed Pages	6-13
6.3.2.3	Target Settings Tabbed Page	6-14
6.3.2.4	Target Information Tabbed Page	6-15
6.3.2.5	HBA Information Tabbed Page	6-16
6.3.2.6	Statistics Tabbed Page	6-17
6.3.2.7	Diagnostics Tabbed Page	6-18

6.3.3	Exiting the SANsurfer Control iX GUI	6-19
6.3.4	Getting Help with the SANsurfer Control iX GUI	6-19
6.3.4.1	Viewing Online Help	6-19
6.3.4.2	Specifying the Browser Location	6-19
6.3.4.3	Viewing SANsurfer Control iX Software Information	6-20
6.3.5	Setting SANsurfer Control iX Security	6-20
6.4	Configuring the QLA4010/4010C HBA	6-22
6.4.1	Setting the IP Address	6-23
6.4.1.1	Setting the IP Address Automatically	6-23
6.4.1.2	Setting the IP Address Manually	6-23
6.4.2	Setting the DNS Server Address	6-23
6.4.2.1	Setting the DNS Server Address Automatically	6-23
6.4.2.2	Setting the DNS Server Address Manually	6-24
6.4.3	Enabling SLP	6-24
6.4.4	Enabling iSNS	6-24
6.5	Configuring Targets	6-25
6.5.1	Configuring Using Discovery	6-25
6.5.2	Configuring Specific Targets	6-27
6.5.3	Changing the Target Configuration Parameters	6-28
6.5.4	Authenticating Targets (CHAP)	6-29
6.6	Configuring the Firmware	6-31
6.6.1	Changing the Firmware Configuration Parameters	6-31
6.6.2	Restoring the Factory Defaults	6-36
6.6.3	Firmware Upgrade	6-36
6.6.4	Updating the ROM	6-38
6.6.5	Viewing the HBA Crash Record	6-38
6.7	Performing Diagnostics	6-39
6.7.1	Pinging a Target	6-39
6.7.2	Viewing the ARP and Connection Error Tables	6-40

Figures

Figure		Page
6-1	Installation Introduction Dialog Box	6-2
6-2	Choose Install Folder Dialog Box	6-3
6-3	Choose Shortcut Folder Dialog Box	6-3
6-4	Create Desktop Icon Selection Dialog Box (Windows 2000/Server 2003)	6-4
6-5	Pre-Installation Summary Dialog Box	6-4
6-6	Install Complete Dialog Box	6-5
6-7	SANsurfer Control iX Icon	6-6

6-8	Host Information Tabbed Page (Main Window)	6-8
6-9	Target Information Tabbed Page	6-10
6-10	LUN List Tabbed Page	6-11
6-11	Host Information Tabbed Page	6-12
6-12	HBA Options Tabbed Page (Firmware).	6-13
6-13	HBA Options Tabbed Page (Network)	6-14
6-14	Target Settings Tabbed Page	6-14
6-15	Target Information Tabbed Page	6-15
6-16	HBA Information Tabbed Page	6-16
6-17	Statistics Tabbed Page	6-17
6-18	Diagnostics Tabbed Page (Ping).	6-18
6-19	Diagnostics Tabbed Page (Log)	6-18
6-20	Browser Location Dialog Box	6-19
6-21	About SANsurfer Control iX Window.	6-20
6-22	Host Security Tabbed Page	6-21
6-23	HBA Tabbed Page (Network)	6-22
6-24	Target Parameters	6-28
6-25	CHAP Tabbed Page	6-30
6-26	Firmware Parameters Table (Read Only)	6-32
6-27	Firmware Parameters Dialog Box	6-32
6-28	Save Firmware Parameters Message	6-33
6-29	Firmware Download Warnings Dialog Box	6-37
6-30	Security Check Dialog Box	6-37
6-31	FW Download Delay Dialog Box	6-37
6-32	Update Firmware Dialog Boxes.	6-38
6-33	Save Crash Record Dialog Box.	6-39
6-34	Ping Status Dialog Box	6-39

Tables

Table	Page
2-1 QLA4010/4010C HBA Operating Environment	2-3
2-2 QLA4010/4010C HBA Specifications	2-3

Section 1

Introduction

1.1

How to Use this Guide

The SANblade™ QLogic® host bus adapters (HBAs) supported in this document are described in the following paragraphs:

- **QLA4010** (single channel, full-height bracket, optical media)
- **QLA4010C** (single channel, full-height bracket, copper media)

The QLA4010 HBA is 32/64-bit, 33/66/133-MHz PCI-X to iSCSI over Gigabit Ethernet on optical media. The QLA4010C HBA is 32/64-bit, 33/66/133-MHz PCI-X to iSCSI over Gigabit Ethernet on twisted-pair copper media.

This guide contains installation instructions for the hardware (QLA4010/4010C HBA), supported software drivers, and the SANsurfer Control iX GUI. Install these components in the following order:

1. Install the QLA4010/4010C HBA in your PC.
2. Install the software driver according to the directions in the appropriate section.
3. Install the SANsurfer Control iX GUI.

1.2

General Description

The QLA4010/4010C is an iSCSI HBA that provides PCI connectivity to SCSI using the iSCSI protocol. This release of the QLA4010/4010C HBA implements draft 20 of the IETF iSCSI standard, which creates a new industry standard SAN technology based on internet protocols: TCP/IP. Any updates to the standard will be available for downloads to the HBA. iSCSI enables new IP-based SANs, which are similar to Fibre Channel SANs, as well as a new set of storage applications, for example, remote storage.

The QLA4010/4010C HBA implements the complete protocol stack, including TCP/IP, on the HBA and off-loads the host of any I/O protocol processing. Off-loading the host frees the system to perform other tasks and deliver optimum total system performance. The QLA4010/4010C HBA handles complete SCSI transactions, iSCSI, TCP/IP, and Ethernet.

1.3 Features

- Compliance with *PCI Local Bus Specification* revision 2.2 and *PCI-X Specification* revision 1.0a
- Supports the IETF iSCSI standard, with soft upgrades as the standard evolves
- 32/64-bit, 33/66/133-MHz universal PCI-X
- 1-Gbps, full-duplex Ethernet
- Complete TCP/IP protocol off-load
- iSCSI initiator and target modes
- RJ45 Gigabit Ethernet connector (QLA4010C HBA)
- Small form factor (LC) fiber optic connector (QLA4010 HBA)

1.4 Technical Support

Customers should contact their authorized maintenance provider for technical support of their QLogic switch products. QLogic-direct customers may contact QLogic Technical Support; others will be redirected to their authorized maintenance provider.

Visit the QLogic support Web site listed in [section 1.4.3](#) for the latest firmware and software updates.

1.4.1 Availability

QLogic Technical Support is available from 7:00 AM to 7:00 PM Central Standard Time, Monday through Friday, excluding QLogic-observed holidays.

1.4.2 Training

QLogic offers certification training for the technical professional for both the SANblade™ HBAs and the SANbox switches. From the training link at www.qlogic.com, you may choose Electronic-Based Training or schedule an intensive "hands-on" Certification course.

Technical Certification courses include installation, maintenance and troubleshooting QLogic SAN products. Upon demonstrating knowledge using live equipment, QLogic awards a certificate identifying the student as a Certified Professional. The training professionals at QLogic may be reached by email at tech.training@qlogic.com.

1.4.3

Contact Information

Address:	QLogic Corporation 6321 Bury Drive Eden Prairie, Minnesota 55346 USA <i><u>(keep or change to AV for iSCSI)?</u></i>
Telephone:	+1 952-932-4040
Fax:	+1 952-932-4018
Email:	
Technical Service	support@qlogic.com
Technical Training	tech.training@qlogic.com
HBA Support Web Site:	http://support.qlogic.com

Notes

Part I **Hardware**

This part of the *QLA4010/4010C User's Guide* describes the host bus adapters (HBAs) and how to install and configure them. See the section that corresponds to your HBA.

HBA	Section
QLA4010/4010C	2

Notes

Section 2

QLA4010/4010C

2.1

Installation in the Computer

Before you install the QLA4010/4010C HBA in your computer, you need the following:

- A screwdriver (usually a Phillips #1)
- An optical multimode cable with an LC-style duplex connector for the QLA4010 HBA.
- A Cat5e or Cat6 straight-through cable (not cross-over cable) with an RJ45 connector for the QLA4010C HBA.

CAUTION! The QLA4010/4010C HBA contains parts that can be damaged by ESD. Before handling the QLA4010/4010C HBA, use standard methods to discharge static electricity. Keep the QLA4010/4010C HBA in the antistatic bag until you are ready to install it. Place the HBA on the bag when you examine or configure it. Retain the bag for future use.

Perform the following steps to install the QLA4010/4010C HBA in your PC:

1. Check the motherboard and make any configuration changes necessary to accommodate the QLA4010/4010C HBA.

The QLA4010/4010C HBA is self-configuring; however, some motherboards require manual configuration. For example, some systems have a **PCI Device Configuration** menu in the motherboard setup BIOS where you must enable HBAs, bus master slots, and IRQ levels. If the motherboard supports triggering, use *level triggering* for the QLA4010/4010C HBA. See the documentation supplied with your computer, or contact your computer dealer to determine if your motherboard requires configuration.

2. Power down the peripherals, then the computer.
3. Remove the computer cover and save the screws.
4. Choose any PCI bus slot that supports bus mastering. Most motherboards automatically assign an IRQ level and interrupt line; if your motherboard does not, you must assign the IRQ level and use *interrupt line A* for this slot.

NOTE:

- Some motherboards have two kinds of PCI bus slots: master and slave. The QLA4010/4010C HBA must be in a PCI bus master slot. (Some motherboards have PCI bus master slots that are shared with onboard devices. QLA4010/4010C HBAs do not work in shared slots.)
 - PCI connectors vary among system HBA manufacturers. The QLA4010/4010C HBA is a 64-bit PCI device that can function in a 32-bit PCI slot; the slot conforms to the PCI specification (the rear edge of the PCI slot is notched). If you try to install the QLA4010/4010C HBA into a PCI slot that does not conform to the PCI specification, you may damage the QLA4010/4010C HBA.
 - PCI and PCI-X slots look the same. If the PC contains both PCI and PCI-X slots, refer to the PC manufacturer's instructions to determine the slot type.
 - The QLA4010/4010C HBAs are designed and tested to operate at PCI bus speeds of up to 66 MHz and PCI-X bus speeds of up to 133 MHz.
5. Remove the slot cover for the slot in which you will install the QLA4010/4010C HBA.
 6. Place the QLA4010/4010C HBA into the slot. Carefully press the HBA into the slot until it seats firmly.
 7. Secure the QLA4010/4010C HBA to the chassis. Follow the PC manufacturer's instructions.
 8. Connect the appropriate cable from the devices to the corresponding connector.
 9. Carefully reinstall the computer cover. Insert and tighten the computer cover screws.
 10. Power up the PC.

See the appropriate section for detailed instructions on how to install the software drivers. See [section 6](#) for detailed instructions on how to install the SANsurfer Control iX GUI.

2.2 Specifications

Tables 2-1 and 2-2 define the QLA4010/4010C HBA specifications.

Table 2-1. QLA4010/4010C HBA Operating Environment

Environment	Minimum	Maximum
Operating temperature	0°C/32°F	55°C/131°F
Storage temperature	–20°C/–4°F	70°C/158°F
Relative humidity (noncondensing)	10%	90%
Storage humidity (noncondensing)	5%	95%

Table 2-2. QLA4010/4010C HBA Specifications

Type	Specifications
Universal PCI specifications	PCI Local Bus Specification, revision 2.2 PCI-X Specification, revision 1.0a 32/64-bit, 33/66/133 MHz 3.3-V and 5-V buses supported (plus/minus five percent)
Standards	IP v.4 SCSI Architecture Model (SAM-2) SCSI-3 Command Set
Connectors	Optical multimode cable with an LC-style duplex connector (QLA4010 HBA) Cat5e or Cat6 straight-through cable (not cross-over cable) with an RJ45 connector (QLA4010C HBA)
Form factor	PCI short card
Operating power	15 watts

2.3 Label

The transceiver on the QLA4010 HBA is a Class I laser product. It complies with IEC 825-1 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated under recommended operating conditions.

CLASS I LASER PRODUCT

2.4 Agency Certification

This information was not available at the time of publication.

Notes

Part II **Software**

This part of the *QLA4010/4010C User's Guide* describes how to install the software drivers for the supported operating systems. See the section that corresponds to your computer's operating system:

Software	Section
Windows [®] 2000	3
Windows Server [™] 2003	4
Red Hat [®] Linux [®]	5

Before you install the software drivers, you need to locate and download the appropriate drivers for your operating system. The drivers are located on the [QLA4010/4010C?](#) CD-ROM. However, check the QLogic web site to be sure you have the latest version (www.qlogic.com).

Notes

Section 3

Windows 2000 Driver Installation (QL4010.SYS)

3.1

Supported Features

The Windows[®] 2000 driver (QL4010.sys) supports the iSCSI features provided by the QLogic QLA4010/4010C iSCSI PCI HBA.

3.2

Driver Files

The following files are provided for installation of the Windows 2000 driver:

- QLA4010\W2K\QLOGIC—Diskette identification file
- QLA4010\W2K\TXTSETUP.OEM—Driver installation script for text mode installation
- QLA4010\W2K\W2K\OEMSETUP.INF—Driver installation script
- QLA4010\W2K\W2K\QL4010.CAT—Catalog file
- QLA4010\W2K\W2K\QL4010.SYS—QLogic QL4010 PCI miniport driver
- QLA4010\W2K\W2K\RELEASE.TXT—Release notes
- QLA4010\W2K\W2K\README.TXT—Helpful hints about the driver

Be sure to review the README.TXT file for both new and changed information.

3.3

Creating the Driver Disk (Optional)

A driver disk is useful when installing the Windows 2000 driver. Follow these steps to create driver disk containing the files needed to install the Windows 2000 driver:

1. Perform the following steps to download the driver:
 - a. To download the driver from the QLA4010 CD-ROM, follow these steps:
 - ❑ Locate the driver link on the QLA4010 CD-ROM. Click the link.
 - ❑ The **File Download** dialog box displays. Click **Download**. Select a directory on your system and download the file.

- b. To download the driver from the QLogic web site, follow these steps:
 - ❑ Locate the driver you want on the QLogic web site (www.qlogic.com) and click **Download**.
 - ❑ When prompted **Would you like to open the file or save it to your computer?**, click the **Save** button. Specify a temporary location on the hard drive and download the driver.
2. Insert a blank disk in drive A.
3. Run the self-extracting file you just downloaded, specifying **A:** for **Unzip To Folder**. Make sure the files listed in [section 3.2](#) are on the disk.

3.4

Installing the Driver

This section is divided into the following three sections:

- Initial OS Installation with the QLA4010/4010C HBA as an Add-on Device
- Adding the QLA4010/4010C HBA to the Existing OS
- Updating the Existing Driver

NOTE:

- The system cannot boot from the device attached to the QLA4010/4010C HBA.; consequently, the operating system (OS) cannot be installed on the device attached to the QLA4010/4010C HBA.
- The QLA4010 is a multifunction PCI device. Function 1 refers to the QLogic iSCSI initiator device.

3.4.1

Initial OS Installation with the QLA4010/4010C HBA as an Add-On Device

NOTE:

- The system cannot boot from a device attached to the QLA4010/4010C HBA; consequently, the operating system (OS) cannot be installed on the device attached to the QLA4010/4010C HBA.
- You must create a driver disk ([see section 3.3](#)) when installing the OS and the QL4010.SYS driver. You cannot install the QL4010.SYS driver directly.

Perform the following steps to install Windows 2000 and the QL4010.SYS driver when the QLA4010/4010C HBA is attached to a nonbootable device:

1. Start the Windows 2000 installation procedure using the Setup disks or CD.
2. If you are booting from the CD and the following message displays, press F6:
Press F6 if you want to install a third party SCSI or RAID Driver...

After all the standard devices have been loaded, press S to **Specify Additional Device**. Go to [step 5](#).

3. If you are booting from the Windows installation floppy disks, after the standard devices have been detected and configured, press S to **Specify Additional Device**.
4. Select **Other** and press ENTER.
5. Insert the QLogic driver disk created in [section 3.3](#) and press ENTER.
6. Select the **QLogic QLA4010 PCI iSCSI Adapter**, then press ENTER.
7. Continue with standard installation procedure.

3.4.2

Adding the QLA4010/4010C HBA to the Existing OS

NOTE: The QLA4010 adapter is a multifunction device. When installed in a plug-and-play system, Windows 2000 detects two functions for each adapter: ethernet controller and network controller.

Perform the following steps to add the QL4010.SYS driver to an existing Windows 2000 system:

1. Install the QLA4010/4010C HBA in the appropriate slot on your computer ([see section 2.1](#)).
2. Restart or power up your computer. Log in as Administrator.
3. When your computer powers up, Windows 2000 detects the newly installed device, then displays the **Found New Hardware with Ethernet Controller** message. The **Found New Hardware Wizard** program is launched to begin installing the QL4010NULL? should be QLA4010.sys? driver for the QLA4010/4010C HBA.
4. Click **Next**.
5. In the **Install Hardware Device Drivers** dialog box, select **Search for a suitable driver for my device (recommended)**. Click **Next**.
6. In the **Locate Driver Files** dialog box, Select **specify a location**. Click **Next**.
7. In the **Copy manufacture's files from:** dialog box, type or browse the path to the QLogic driver directory. For example:
A: \
8. Click **OK**.
9. In the **Driver Files Search Results** dialog box, click **Next**.
10. In the **Completing the Found New Hardware Wizard** dialog box, click **Finish**.

11. Windows 2000 displays the **Found New Hardware—Network Controller** message. The **Found New Hardware Wizard** program is launched to begin installing the QL4010.SYS driver for the QLA4010.
12. Click **Next**.
13. In the **Install Hardware Device Drives** dialog box, select **Search for a suitable driver for my device (recommended)**. Click **Next**.
14. Select **specify a location**. Click **Next**.
15. In the **Copy manufacture's files from:** dialog box, type or browse the path to the QLogic driver directory. For example:

```
A: \
```
16. Insert the QLogic driver disk created in [section 3.3](#).
17. In the **Driver Files Search Results** dialog box, click **Next**.
18. If the **Digital Signature Not Found** dialog box displays, click **Yes**.
19. In the **Completing the Found New Hardware Wizard** dialog box, click **Finish**.
20. The following message displays:

```
Your hardware settings have changed. You must restart your  
computer for these changes to take effect.  
  
Do you want to restart your computer now?
```


Click **Yes**.

After QLogic obtains a Digital Signature for the driver through the official WHQL process from Microsoft, the Digital Signature Not found dialog box will not display. (can this sentence, which is in other HBA user's guides, be removed?)

3.4.3

Updating the Existing Driver

Perform the following steps if the QL4010.SYS driver is already installed and you want to install an updated version of the driver:

1. To start the **Device Manager**, click **Start**, point to **Settings**, click **Control Panel**, double-click the **System** applet, select the **Hardware** tab, and click the **Device Manager** button.
2. Use the scroll bar to scroll down the list of hardware types. Double-click **SCSI and RAID Host Bus Adapter**.
3. Double-click **QLogic QLA4010 PCI iSCSI Adapter** from the devices list. The **Adapter Property** window displays.
4. Click the **Driver** tab, then click **Update Driver** to start the **Upgrade Device Driver Wizard**. Click **Next**.

5. In the **Install Hardware Device Drivers** dialog box, select **Display a list of the known device drivers for this device so that I can choose a specific driver**
6. Click **Next**.
7. In the **Select a Device Drive** dialog box, click **Have Disk**. Insert the QLogic driver disk created in [section 3.3](#).
8. In the **Install From Disk** dialog box, type or browse the path to the QLogic driver directory. For example:

A: \

Click **OK**.

9. In the **Upgrade Device Driver Wizard/Select a Device Driver** dialog box, click **Next**.
10. In the **Upgrade Device Driver Wizard/Start Device Driver Installation** dialog box, click **Next**.
11. If the **Digital Signature Not Found** dialog box displays, click **Yes**.
12. In the **Upgrade Device Driver Wizard/Completing the Upgrade Device Driver Wizard** dialog box, click **Finish**.
13. The following message displays:

Your hardware settings have changed. You must restart your computer for these changes to take effect. Do you want to restart your computer now?

Click **Yes** to restart the computer.

After QLogic obtains a Digital Signature for the driver through the official WHQL process from Microsoft, the Digital Signature Not found dialog box will not display. (can this sentence, which is in other HBA user's guides, be removed?)

3.5

Removing the Driver

To uninstall the QLA4010.SYS driver, power down your computer and remove the QLA4010/4010C HBA from your computer according to the manufacturer's instructions.

NOTE: You do not have to use the **Device Manager** or the **Hardware Wizard** to uninstall the QLA4010/4010C HBA. After you have removed the QLA4010/4010C HBA and restarted your computer, Windows 2000 recognizes that it has been removed.

Notes

Section 4

Windows Server 2003 Driver Installation (QL4010.SYS)

4.1

Supported Features

The Windows Server™ 2003 driver (QL4010.sys) supports the iSCSI features provided by the QLogic QLA4010/4010C iSCSI PCI HBA.

4.2

Driver Files

The following files are provided for installation of the Windows Sever 2003 driver:

- QLA4010\W2K\QLOGIC—Diskette identification file
- QLA4010\W2K\TXTSETUP.OEM—Driver installation script for text mode installation
- QLA4010\W2K\W2K\OEMSETUP.INF—Driver installation script
- QLA4010\W2K\W2K\QL4010.CAT—Catalog file
- QLA4010\W2K\W2K\QL4010.SYS—QLogic QL4010 PCI miniport driver
- QLA4010\W2K\W2K\RELEASE.TXT—Release notes
- QLA4010\W2K\W2K\README.TXT—Helpful hints about the driver

Be sure to review the README.TXT file for both new and changed information.

4.3

Creating the Driver Disk (Optional)

A driver disk is useful when installing the Windows Sever 2003 driver. Follow these steps to create driver disk containing the files needed to install the Windows Sever 2003 driver:

1. Perform the following steps to download the driver:
 - a. To download the driver from the QLA4010 CD-ROM, follow these steps:
 - Locate the driver link on the QLA4010 CD-ROM. Click the link.
 - The **File Download** dialog box displays. Click **Download**. Select a directory on your system and download the file.

- b. To download the driver from the QLogic web site, follow these steps:
 - ❑ Locate the driver you want on the QLogic web site (www.qlogic.com) and click **Download**.
 - ❑ When prompted **Would you like to open the file or save it to your computer?**, click the **Save** button. Specify a temporary location on the hard drive and download the driver.
2. Insert a blank disk in drive A.
3. Run the self-extracting file you just downloaded, specifying **A:** for **Unzip To Folder**. Make sure the files listed in [section 4.2](#) are on the disk.

4.4

Installing the Driver

This section is divided into the following three sections:

- Initial OS Installation with the QLA4010/4010C HBA as an Add-on Device
- Adding the QLA4010/4010C HBA to the Existing OS
- Updating the Existing Driver

NOTE:

- The system cannot boot from the device attached to the QLA4010/4010C HBA.; consequently, the operating system (OS) cannot be installed on the device attached to the QLA4010/4010C HBA.
- The QLA4010 is a multifunction PCI device. Function 1 refers to the QLogic iSCSI initiator device.

4.4.1

Initial OS Installation with the QLA4010/4010C HBA as an Add-On Device

NOTE:

- The system cannot boot from a device attached to the QLA4010/4010C HBA; consequently, the operating system (OS) cannot be installed on the device attached to the QLA4010/4010C HBA.
- You must create a driver disk ([see section 4.3](#)) when installing the OS and the QL4010.SYS driver. You cannot install the QL4010.SYS driver directly.

Perform the following steps to install Windows Sever 2003 and the QL4010.SYS driver when the QLA4010/4010C HBA is attached to a nonbootable device:

1. Start the Windows Sever 2003 installation procedure using the Setup disks or CD.
2. If you are booting from the CD and the following message displays, press F6:
Press F6 if you want to install a third party SCSI or RAID Driver...

After all the standard devices have been loaded, press S to **Specify Additional Device**. Go to [step 5](#).

3. If you are booting from the Windows installation floppy disks, after the standard devices have been detected and configured, press S to **Specify Additional Device**.
4. Select **Other** and press ENTER.
5. Insert the QLogic driver disk created in [section 4.3](#) and press ENTER.
6. Select the **QLogic QLA4010 PCI iSCSI Adapter**, then press ENTER.
7. Continue with standard installation procedure.

4.4.2

Adding the QLA4010/4010C HBA to the Existing OS

NOTE: The QLA4010 adapter is a multifunction device. When installed in a plug-and-play system, Windows Sever 2003 detects two functions for each adapter: ethernet controller and network controller.

Perform the following steps to add the QL4010.SYS driver to an existing Windows Sever 2003 system:

1. Install the QLA4010/4010C HBA in the appropriate slot on your computer ([see section 2.1](#)).
2. Restart or power up your computer. Log in as Administrator.
3. When your computer powers up, Windows Sever 2003 detects the newly installed device, then displays the **Found New Hardware with Ethernet Controller** message. The **Found New Hardware Wizard** program is launched to begin installing the QL4010NULL? should be QLA4010.sys? driver for the QLA4010/4010C HBA.
4. Select **Install from a list or specific location (Advanced)**. Click **Next**.
5. Select **Search for the best driver in these locations**. Type or browse the path of the QLogic driver directory. For example:

A: \
6. Insert the QLogic driver disk created in [section 4.3](#). Click **Next**.
7. When the **Security Alert—Driver Installation** dialog box displays, click **Yes**.
8. In the **Completing the Found New Hardware Wizard** dialog box, click **Finish**.
9. Windows Sever 2003 displays the **Found New Hardware Wizard with Network Controller** message. The **Found New Hardware Wizard** program is launched to begin installing the QL4010.SYS driver for the QLA4010.
10. Select **Install from a list or specific location (Advanced)**. Click **Next**.

11. Select **Search for the best driver in these locations**. Type or browse the path of the QLogic driver directory. For example:

A: \
12. Click **Next**.
13. The **Hardware Installation** dialog box displays, click **Continue Anyway**.
14. In the **Completing the Found New Hardware Wizard** dialog box, click **Finish**.

4.4.3

Updating the Existing Driver

Perform the following steps if the QL4010.SYS driver is already installed and you want to install an updated version of the driver:

1. To start the **Device Manager**, click **Start**, point to **Settings**, click **Control Panel**, double-click the **System** applet, select the **Hardware** tab, and click the **Device Manager** button.
2. Use the scroll bar to scroll down the list of hardware types. Double-click **SCSI and RAID Controller**.
3. Double-click **QLogic QLA4010 PCI iSCSI Adapter** from the devices list. Click **Properties**.
4. Click the **Driver** tab, then click **Update Driver** to start the **Upgrade Device Driver Wizard**. Click **Next**.
5. Select **Install from a list or specific location (Advanced)**. Click **Next**.
6. Select **Don't search I will choose the driver to install**. Click **Next**.
7. Insert the QLogic driver disk created in [section 4.3](#). Click **Have Disk**.
8. In the **Install From Disk** dialog box, in the **Copy manufacturer's files from** field, type or browse the path to the QLogic driver directory. For example:

A: \
- Click **OK**.
9. The **Hardware Update Wizard/Select a Device Driver** dialog box displays. Click **Next**.
10. In the **Upgrade Device Driver Wizard/Start Device Driver Installation** dialog box, click **Next**.
11. The **Hardware Installation** dialog box displays, click **Continue Anyway**.
12. In the **Hardware Update Wizard/Completing the Hardware Update Wizard** dialog box, click **Finish**.

4.5

Removing the Driver

To uninstall the QLA4010.SYS driver, power down your computer and remove the QLA4010/4010C HBA from your computer according to the manufacturer's instructions.

NOTE: You do not have to use the **Device Manager** or the **Hardware Wizard** to uninstall the QLA4010/4010C HBA. After you have removed the QLA4010/4010C HBA and restarted your computer, Windows Sever 2003 recognizes that it has been removed.

Notes

Section 5

Red Hat Linux Driver Installation

5.1

Introduction

This section provides instructions for installing the Red Hat Linux driver on an already installed Red Hat Linux 8, 9, or Advanced Server 2.1 (kernel 2.4.x) operating system. Earlier or later versions of Red Hat Linux are not currently supported.

The latest version of the software drivers and documentation for Red Hat Linux are available on the QLogic Web site, www.qlogic.com. Be sure to review the README.qla4xxx file for both new and changed information.

To install the Red Hat Linux driver, build the driver from the source code. Then load the driver either manually or through a RAMDISK image, which you must build.

Before installing the driver (either by a custom kernel or by the source code), you must create a driver disk ([see section 5.2](#)).

5.2

Creating the Driver Floppy Disk

Perform the following steps to create a driver disk from the QLogic web site:

1. Download the qla4xxxsrc-vx.xx.tgz file from the QLogic Web site.
2. The **File Download** window prompts: **Would you like to open the file or save it to your computer?** Click the **Save** button.
3. Insert a blank disk.
4. Download the file to the disk.

5.3

Installing the Driver

From the source code, you can build the qla4010.o driver for your uniprocessor (UP) or symmetric multiprocessor (SMP) system, then load the driver manually or automatically using a RAMDISK image during system boot time.

To build a UP version of the qla4010 driver, [see section 5.3.1](#). To build an SMP version of the qla4010 driver, [see section 5.3.2](#).

After building a UP or SMP version of the driver, you must load the driver by one of the following methods:

- Manually ([see section 5.3.3](#))
- Through a RAMDISK image, which you must build ([see section 5.3.4](#))

5.3.1

Building a Uniprocessor (UP) Version of the Driver

Perform the following steps to build a UP version of the qla4xxx driver:

1. Extract the kernel-header and kernel-source RPM files from the first Red Hat CD-ROM.

```
# cd /mnt/cdrom/RedHat/RPMS
# rpm -iv kernel-headers*.rpm (Not required for Red Hat 9.)
# rpm -iv kernel-source*.rpm (Not required for Red Hat 9.)
```

2. Prepare source headers by changing to the kernel source directory. For example:

```
# cd /usr/src/linux-2.4
```

3. Configure additional support. First, type the following command to access the **Main Menu**:

```
# make menuconfig
```

- a. From the **Main Menu**, select **SCSI Support** and press ENTER.
- b. From the **SCSI Support** menu, select **SCSI Disk Support**.
- c. From the **SCSI Disk Support** menu, select **SCSI Generic Support**.
- d. Select **Exit** to exit the **Main Menu**.

The system prompts **Do you wish to save your new kernel configuration?** Select **Yes**. The system saves a new config file `.config` in the current directory.

4. Under the kernel source directory, type the following:

```
# make dep
```

5. Create a new directory, `/qla4xxx`. Using the disk created in [section 5.2](#), copy the `qla4xxxsrc-vx.xx.tgz` file to `/qla4xxx` and extract the files. For example:

```
# mkdir qla4xxx
# cd qla4xxx
# cp mcopy a:*.tgz . (The period (.) at the end is required.)
# tar -xvzf *.tgz
```

6. Build the driver `qla4010.o` from the source code by typing:

```
# make SMP=0
```

NOTE: Refer to Makefile for additional supported command line parameters.

After building a UP version of the driver, you must load the driver by one of the following methods:

- Manually ([see section 5.3.3](#))
- Through a RAMDISK image, which you must build ([see section 5.3.4](#))

5.3.2

Building a Symmetric Multiprocessor (SMP) Version of the Driver

Perform the following steps to build an SMP version of the qla4xxx driver:

1. Extract the kernel-header and kernel-source RPM files from the first Red Hat CD-ROM.

```
# cd /mnt/cdrom/RedHat/RPMS
# rpm -iv kernel-headers*.rpm (Not required for Red Hat 9.)
# rpm -iv kernel-source*.rpm (Not required for Red Hat 9.)
```

2. Prepare source headers for an SMP module build by changing to the Linux source directory. Type the following:

```
# cd /usr/src/linux-2.4
```

3. Type the following command to access the **Main Menu**.

```
# make menuconfig
```

- a. From the **Main Menu**, select **Processor type and features** and press ENTER.
- b. From the **Processor Type and Features** menu, select **Symmetric multiprocessor** and press the SPACEBAR.
- c. Select **Exit** to exit the **Processor Type and Features** menu.
- d. Select **SCSI Support** and press ENTER.
- e. Select **SCSI Disk Support** and press ENTER.
- f. Select **SCSI Generic Support** and press ENTER.
- g. Select **Exit** to exit the **SCSI Support** menu.
- h. Select **Exit** to exit the **Main Menu**.

The system prompts **Do you wish to save your new kernel configuration?** Select **Yes**. The system saves a new config file .config in the current directory.

4. Under the kernel source directory, type the following:

```
# make dep
```

5. Create a new directory, /qla4xxx. Using the driver disk created in [section 5.2](#), copy the qla4xxxsrc-vx.xx.tgz file to /qla4xxx and extract the files. For example:

```
# mkdir qla4xxx
# cd qla4xxx
# mcopy a:*.tgz . (The period (.) at the end is required.)
# tar -xvzf *.tgz
```

6. Build the qla4010.o driver from the source code by typing:

```
# make
```

NOTE: Refer to Makefile for additional supported command line parameters.

After building an SMP version of the driver, you must load the driver by one of the following methods:

- Manually ([see section 5.3.3](#))
- Through a RAMDISK image, which you must build ([see section 5.3.4](#))

5.3.3

Loading the Driver Manually

Before loading the driver manually, you must build a UP or SMP version of the driver, as described in [sections 5.3.1](#) and [5.3.2](#).

To load the driver directly from the local build directory, type the following:

```
# insmod ./qla4010.o
```

To load the driver using modprobe, follow these steps:

1. Copy driver binary files. Type the following:

```
# cp qla4010.o /lib/modules/<kernel
version>/kernel/drivers/scsi/
```

2. Update the module dependency file. You can either enter the `depmod -a` command or make sure that the following line is in the `/lib/modules/<kernel release version>/modules.dep` file:

```
/lib/modules/<kernel version>/kernel/drivers/scsi/qla4010.o: \
/lib/modules/<kernel version>/kernel/drivers/scsi/scsi_mod.o
```

3. Type the following to load the driver:

```
# modprobe qla4010
```

5.3.4

Building a RAMDISK Image to Load the Driver Automatically

You can load the qla4xxx driver at boot time using a RAMDISK image. For more information, refer to the Red Hat installation guide.

Before building a RAMDISK image, you must build a UP or SMP version of the driver, as described in section 5.3.1 or 5.3.2.

Perform the following steps to load the qla4010 driver using a RAMDISK image:

1. Copy the files to `/lib/modules/<kernel version>/kernel/drivers/scsi/` by typing:

```
# make install
```

2. Add the following line to `/etc/modules.conf`:

```
alias scsi_hostadapter0 qla4010
```

If there are multiple QLA4010/4010C HBAs in the system, you must have one entry for each HBA in the `/etc/modules.conf` file. For example, if there are two QLA4010/4010C HBAs in the system, add the following lines:

```
alias scsi_hostadapter0 qla4010
```

```
alias scsi_hostadapter1 qla4010
```

3. Type the following command to build the RAMDISK image that contains the `qla4010.o` module:

```
# mkinitrd -f <RAMDISK image file name> <kernel version>
```

For example:

```
# mkinitrd -f /boot/newinitrd-image.img 2.4.7-10
```

```
# mkinitrd -f /boot/newinitrd-image.img 2.4.7-10smp
```

NOTE: To obtain your kernel version before using the above command, type:

```
# uname -r
```

Copy the file to /boot. (remove this sentence? It's not in the readme file.)

4. Configure the boot loader with the new RAMDISK image.

For LILO, perform the following steps:

- a. Add the following line to one of the kernel entry sections in the `/etc/lilo.conf` file to use the RAMDISK image:

```
initrd=/boot/newinitrd-image.img
```

- b. Run LILO by typing the following:

```
#!/sbin/lilo
```

- c. Reboot the system.

For GRUB, perform the following steps:

- a. Add the following line to one of the kernel entry sections in the `/etc/grub.conf` file to use the RAMDISK image:

```
initrd /newinitrd-image.img
```

- b. Reboot the system. Select the kernel with the new RAMDISK image.

5.3.5

Building a Custom Kernel with the QLogic Driver

Should this section be in the manual? This is new to me. Also, how do these instructions fit with the rest of this section? Is this procedure instead of, or in addition to, building a UP or SMP version of the driver?

Since it is not feasible to construct a single set of kernel build instructions for every possible hardware or software configuration, this section provides an example of how to compile the driver into the Linux kernel. You may have to make some adjustments in the procedure for your particular system hardware or software configuration.

This process is only supported in Red Hat versions 8, 9, and Advanced Server 2.1. In the following sections, the kernel source tree is referenced as /usr/src/linux. Under the Red Hat distribution, the normal directory path is /usr/src/linux-2.4.

5.3.5.1

Prerequisites

Verify that both kernel-headers and kernel-source RPMs are already installed by typing the following:

```
# rpm -qa | grep kernel
```

If the kernel-headers and kernel-source RPMs are not installed, install them from the distribution CD by typing:

```
# rpm -i kernel-source* (Not required for Red Hat 9.)  
# rpm -i kernel-headers* (Not required for Red Hat 9.)
```

5.3.5.2

Building a Custom Kernel to Load the Driver

The following instructions provide an example of how to build a custom kern to load the driver.

1. Create a directory under kernel source tree. Using the driver disk created in [section 5.2](#), copy the qla4xxxsrc-vx.xx.tgz file to the directory and extract the files. For example:

```
# mkdir /usr/src/linux/drivers/scsi/qla4xxx/  
# cd /usr/src/linux/drivers/scsi/qla4xxx/  
# mcopy a:*.tgz . (The period (.) at the end is required.)  
# tar -xvzf *.tgz  
# rm -f Makefile  
# cp -f Makefile.kernel Makefile
```

2. Edit the Makefile under the kernel scsi directory. For example:

```
# cd /usr/src/linux/drivers/scsi  
# vi Makefile
```

- a. For Red Hat Advanced Server 2.1, locate the following line:

```
subdir-$(CONFIG_SCSI_AIC7XXX) += aic7xxx
```

Add the following line below it:

```
subdir-$(CONFIG_SCSI_QLOGIC_QLA4010) += qla4xxx
```

For RedHat 8 and 9, locate the following line:

```
subdir-m += aic7xxx
```

Add the following lines below it:

```
subdir-y += qla4xxx
```

```
subdir-m += qla4xxx
```

- b. Locate the following line:

For RedHat Advanced Server 2.1:

```
obj-$(CONFIG_SCSI_QLOGIC_QLA2100) += qla2x00.o
```

For Red Hat 8 and 9:

```
obj-$(CONFIG_SCSI_QLOGIC_QLA1280) += qla1280.o
```

Add the following line below it:

```
obj-$(CONFIG_SCSI_QLOGIC_QLA4010) += qla4xxx/qla4010.o
```

- c. Append the following lines to the end of the Makefile:

```
qla4xxx/qla4010.o:
    cd qla4xxx; make qla4010.o
```

3. Edit the Config.in file under the kernel scsi directory by typing:

```
# cd /usr/src/linux/drivers/scsi
# vi Config.in
```

Locate the following lines:

For RedHat Advanced Server 2.1:

```
dep_tristate 'Qlogic QLA 2100 FC SCSI support'
CONFIG_SCSI_QLOGIC_QLA2100 $CONFIG_SCSI

dep_tristate 'Qlogic QLA 2200 FC SCSI support'
CONFIG_SCSI_QLOGIC_QLA2200 $CONFIG_SCSI
```

For Red Hat 8 and 9:

```
dep_tristate 'Qlogic QLA 1280 FC SCSI support'
CONFIG_SCSI_QLOGIC_QLA1280 $CONFIG_SCSI
```

Add the following line below it:

```
source drivers/scsi/qla4xxx/Config.in
```

4. Configure the kernel to load the QLogic driver by typing:

```
# cd /usr/src/linux
# make menuconfig
```

Make sure built-in support is selected for the following options by doing the following:

- a. From the **Main Menu**, select **SCSI Support** and press ENTER.
- b. From the **SCSI Support** menu, select **SCSI Disk Support**.
- c. From the **SCSI Disk Support** menu, select **SCSI Generic Support**.
- d. Select **SCSI low-level drivers**, then press ENTER.
- e. Select **QLogic QLA 4010 iSCSI support**.
- f. Select **Exit** to return to the **SCSI Support** menu.
- g. Select **Exit** to return to the **Main Menu**.
- h. Select **Exit** to exit the **Main Menu**.

The system prompts:

```
"Do you wish to save your new kernel configuration?".
```

Select **Yes**. The system saves a new config file called `.config` in the current directory.

5. Build the kernel by typing:

```
# make dep bzImage modules modules_install
```

6. Configure the boot loader to load the new kernel by typing:

```
# cd /usr/src/linux/arch/i386/boot
# cp bzImage /boot/newKernel
```

For LILO, perform the following steps:

- a. Add a section for newKernel in the `/etc/lilo.conf` file. For example:

```
image=/boot/newKernel
label=newKernel
read-only
root=/dev/sda
```

- b. To load newKernel by default, update the `default=` line at the top of the `/etc/lilo.conf` file as follows:

```
default=newKernel
```

- c. Load the new boot configuration by typing:

```
# lilo
```

- d. Restart the system. The new kernel image containing the qla4010 driver is now the default boot image.

For GRUB, perform the following steps:

- a. Add a section for newKernel in the /etc/grub.conf file. For example:

```
title Red Hat Linux-newKernel (2.4.7-10)
root (hd0,0)
kernel /newKernel ro root=/dev/hda2
```

- b. Restart the system. The new kernel image containing the qla4010 driver is now the default boot image.

5.4

System Driver Parameter max_scsi_luns

Support for multiple LUNs can be configured in one of three ways. Currently, the maximum number of LUNs that can be scanned for each device is 128.

The kernel must be configured to have multiple LUN support enabled for nonzero LUNs to be configured and accessible. Use the `make menuconfig` command to build a kernel that has the option under SCSI Support enabled to probe all LUNs on SCSI devices. See the BUILD_KERNEL.txt file for more information on the `make menuconfig` command.

NOTE: If you have multiple HBAs, set max_scsi_luns to the largest number of LUNs supported by any one of these HBAs.

- To configure multiple LUN support during boot time, type the following at the boot prompt:

```
boot: linux max_scsi_luns=128
```

- If the SCSI Mid-Layer is compiled as a module, add the following line to the /etc/modules.conf file to scan for multiple LUNs at each boot:

```
option scsi_mod max_scsi_luns=128
```

NOTE: You must create a RAMDISK image for this modification to take effect.

- If the SCSI Mid-Layer is compiled in the kernel, the boot loader can be configured to scan for multiple LUNs each time the system boots.

For LILO, perform the following steps:

1. Add the following line to each of the kernel images listed in the /etc/lilo.conf file:

```
append="max_scsi_luns=128"
```

2. Run LILO by typing the following:

```
#/sbin/lilo
```

3. Reboot the system.

For GRUB, perform the following steps:

1. Append the `max_scsi_luns` parameters to each of the kernel images listed in the `/etc/grub.conf` file. For example:

```
kernel /vmlinuz-2.4.7-10 ro root=/dev/hda2 max_scsi_luns=128
```

2. Reboot the system.

5.5

Driver Command Line Parameters

Type the following command to display a list and description of the supported driver command line parameters:

```
# modinfo qla4010.o
```

The following are examples of driver command line parameters:

```
#insmod qla4010.o ql4xmaxqdepth=2
#insmod qla4010.o ql4xcmdretrycount=20
#insmod qla4010.o displayConfig=1
```

5.6

Proc Filesystem Support

The `/proc` filesystem for the QLA4010/4010C driver can be found in the `/proc/scsi/qla4010/` directory. This directory contains a file for each QLogic iSCSI HBA in the system. Each file presents information about the adapter and transfer statistics for each discovered LUN. The following example command lines display the file for the associated QLA4010/4010C HBA:

```
cat /proc/scsi/qla4010/1
cat /proc/scsi/qla4010/2
```


Part III **Applications**

This part of the *QLA4010/4010C User's Guide* describes the SANsurfer Control iX GUI, a stand-alone utility for configuring your QLA4010/4010C HBA, referred to as *HBA* or *adapter*.

Section 6 contains the following information:

- An overview of SANsurfer Control iX
- Installation instructions
- Uninstallation instructions
- Operating instructions

At the time of publication, the latest version of SANsurfer Control iX is available on the QLogic web site (www.qlogic.com). *Will it be on its own CD with the drivers?*

Notes

Section 6

SANsurfer Control iX

6.1

Introduction

The QLA4010/4010C HBA includes the SANsurfer Control iX GUI. The SANsurfer Control iX GUI interface runs on Windows 2000 and Red Hat Linux operating systems. SANsurfer Control iX configures the QLA4010/4010C HBA that resides in the host PC and allows you to:

- Set the QLA4010/4010C HBA's basic configuration (IP address, iSCSI name, etc.)
- Enter iSCSI target information (IP addresses of targets to which you want to connect)
- Edit the target and firmware configuration parameters
- Read back useful QLA4010/4010C HBA and target information

6.2

Installing SANsurfer Control iX

6.2.1

Initial Installation

Follow these steps to install the SANsurfer Control iX GUI:

1. Download SANsurfer Control iX from the QLogic web site:
 - a. Locate SANsurfer Control iX on the QLogic web site (www.qlogic.com) and click **Download**.
 - b. When prompted **Would you like to open the file or save it to your computer?**, click the **Save** button. Specify a temporary location on the hard disk and download the self-extracting file.
2. Do one of the following to select and start the installation:
 - For a Windows 2000 system, locate the folder where you downloaded SANsurfer Control iX. Double-click the file name.

- ❑ For a Red Hat Linux system, do the following:
 - (1) Open a shell.
 - (2) Change to the directory where you downloaded the SANSurfer installer.
 - (3) Type the following and then press ENTER to ensure that the SANSurfer Control iX installer file is executable. *install* is the SANSurfer installer file.

`/install.bin`

3. InstallAnywhere prepares to install SANSurfer Control iX. The Introduction dialog box displays. Follow the instructions and click **Next**.

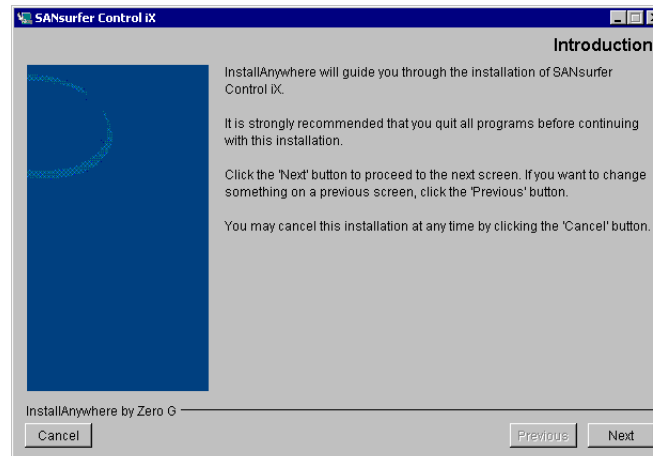


Figure 6-1. Installation Introduction Dialog Box

4. The **Choose Install Folder** dialog box displays (see figure 6-2). Click **Next** to accept the default directory.

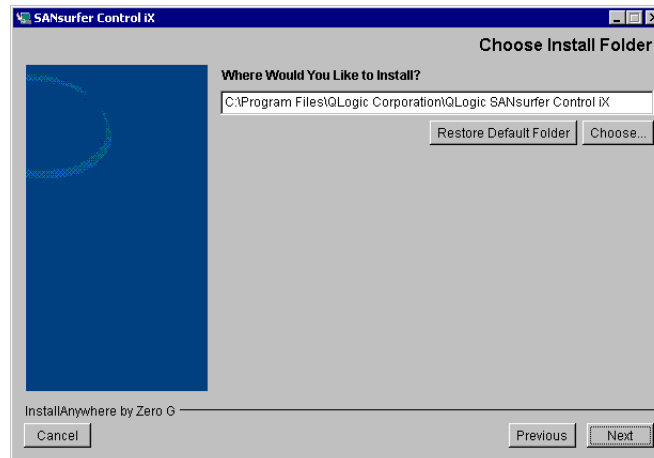


Figure 6-2. Choose Install Folder Dialog Box

5. The **Choose Shortcut Folder** dialog box displays (see figure 6-3). Use the radio buttons to make your selection. Click **Next**.

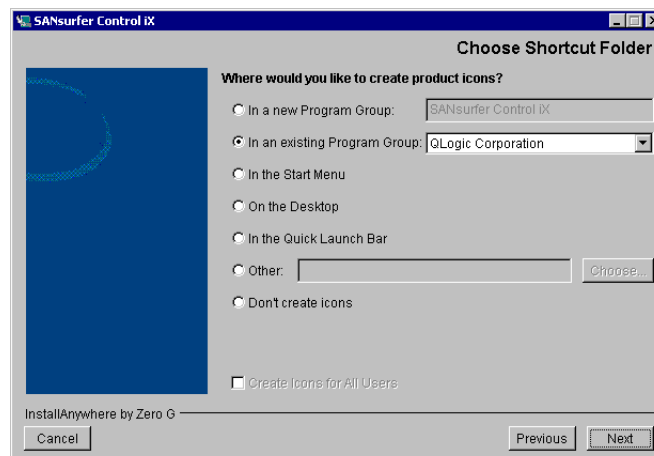


Figure 6-3. Choose Shortcut Folder Dialog Box

6. If you are installing the SANSurfer Control iX GUI on a Windows 2000 system, the **Create Desktop Icon Selection** dialog box displays (see figure 6-4).

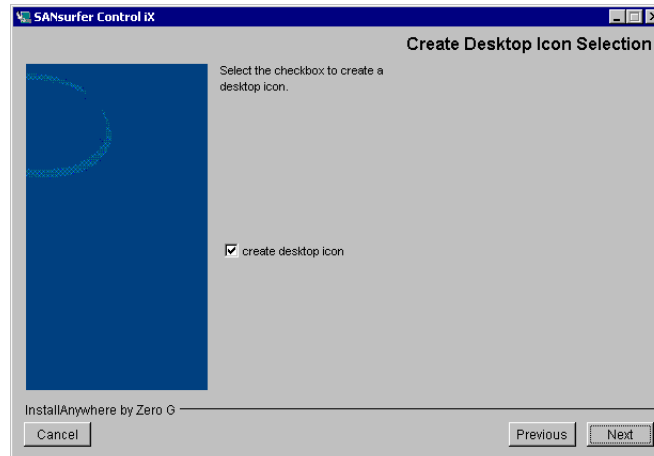


Figure 6-4. Create Desktop Icon Selection Dialog Box (Windows 2000/Server 2003)

Do the following:

- a. Select the **create desktop icon** check box (default) if you want the **SANSurfer** icon to display on the desktop.
 - b. Click **Next**.
7. The **Pre-installation Summary** dialog box displays (see figure 6-5). If the information is not correct, click **Previous** to back-track and make the appropriate changes. If the information is correct, click **Install**.

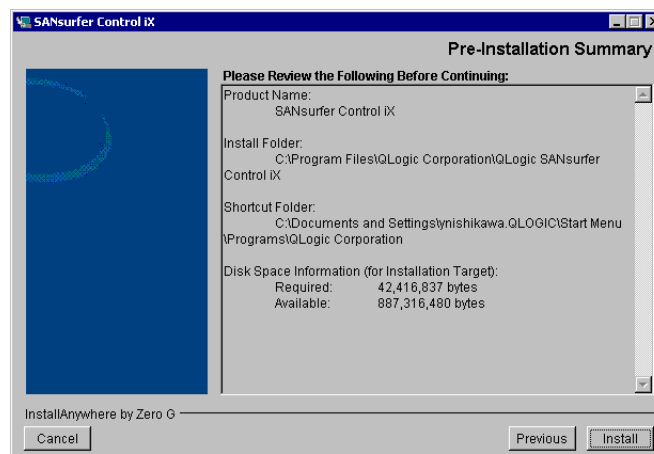


Figure 6-5. Pre-Installation Summary Dialog Box

8. The **Install Complete** dialog box displays (see figure 6-6). Click **Done**.

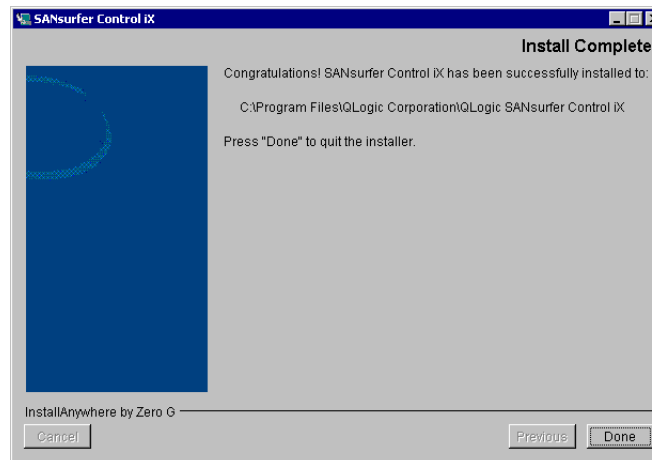


Figure 6-6. Install Complete Dialog Box

9. To run SANsurfer Control iX, click **Start**, select **Programs**, select the install group (the default is **QLogic Corporation**), then click **SANsurfer Control iX**. If you selected **Desktop** in [step 5](#), double-click the icon on your desktop.

6.2.2 Uninstalling SANsurfer Control iX

6.2.2.1 Windows 2000

To uninstall the SANsurfer Control iX GUI for Windows 2000, do the following:

From the **Start** menu, point to **Programs**, point to **QLogic Corporation**, point to **SANsurfer Control iX**, then click **Uninstall SANsurfer Control iX**.

6.2.2.2 Red Hat Linux

Follow these steps to uninstall the SANsurfer Control iX GUI for Red Hat Linux:

1. Change to the directory where SANsurfer Control iX is installed. For example, type the following and then press ENTER:

```
cd /opt/QLogic_Corporation/SANsurfer_Control_iX
```

2. Type the following to uninstall the SANsurfer Control iX GUI:

```
./Uninstall_SANsurfer_Controlix
```

6.3

Getting Started

This section includes the procedures for starting the SANsurfer Control iX GUI, exiting the SANsurfer Control iX GUI, and customizing the application options and policies.

This section discusses:

- Starting the SANsurfer Control iX GUI ([see section 6.3.1](#))
- SANsurfer Control iX main window ([see section 6.3.2](#))
- Exiting the SANsurfer Control iX GUI ([see section 6.3.3](#))
- Getting help ([see section 6.3.4](#))
- Setting SANsurfer Control iX security ([see section 6.3.5](#))

6.3.1

Starting SANsurfer Control iX

The SANsurfer Control iX GUI startup procedures differ depending upon the operating system. This section discusses starting the SANsurfer HBA Manager GUI on the following systems:

- Windows 2000 ([see section 6.3.1.1](#))
- Red Hat Linux ([see section 6.3.1.2](#))

6.3.1.1

Starting SANsurfer Control iX on Windows 2000

In Windows 2000, do one of the following to start the SANsurfer Control iX application. When done, the SANsurfer Control iX main window displays ([see section 6.3.2](#)).

- Double-click the **SANsurfer Control iX** icon on your desktop (if the icon was created during installation) ([see figure 6-7](#)).



Figure 6-7. SANsurfer Control iX Icon

- Click **Start**, select **Programs**, select the install group (the default is **QLogic Corporation**), select **SANsurfer Control iX**, then click **SANsurfer Control iX**.
- Click the **Start** button, click **Run**, and then do one of the following:
 - Type in the name of SANsurfer Control iX ([SANsurfer Control iX.EXE or Install.EXE? \(conflicting review comments\)](#)), including all the paths. Click **OK**.
 - Click **Browse**, then select the program after finding it in the **Browse** dialog box. Click **Open**.

6.3.1.2

Starting SANsurfer Control iX on Red Hat Linux

On a Red Hat Linux system, perform the following steps to start the SANsurfer Control iX GUI. When done, the SANsurfer HBA Manager main window displays (see [section 6.3.2](#)).

1. Ensure that you are in a graphical user environment.
2. Open a command terminal.
3. Change to the directory where the SANsurfer Control iX application is installed. The default location is `/opt/QLogic_Corporation/SANsurfer_Control_iX`.
4. Type `./SANsurfer_Control_iX` and then press ENTER to start the SANsurfer HBA Manager GUI.

6.3.2

Main Window and Window Navigation

This section provides an overview of SANsurfer Control iX, including how to navigate through the screens and tabbed pages. The purpose of each screen is described. See [sections 6.4](#) through [6.7](#) for information on using SANsurfer Control iX to view and configure the HBAs.

When SANsurfer Control iX starts, the first screen is the main window, which defaults to the **Host Information** tabbed page (see figure 6-8).

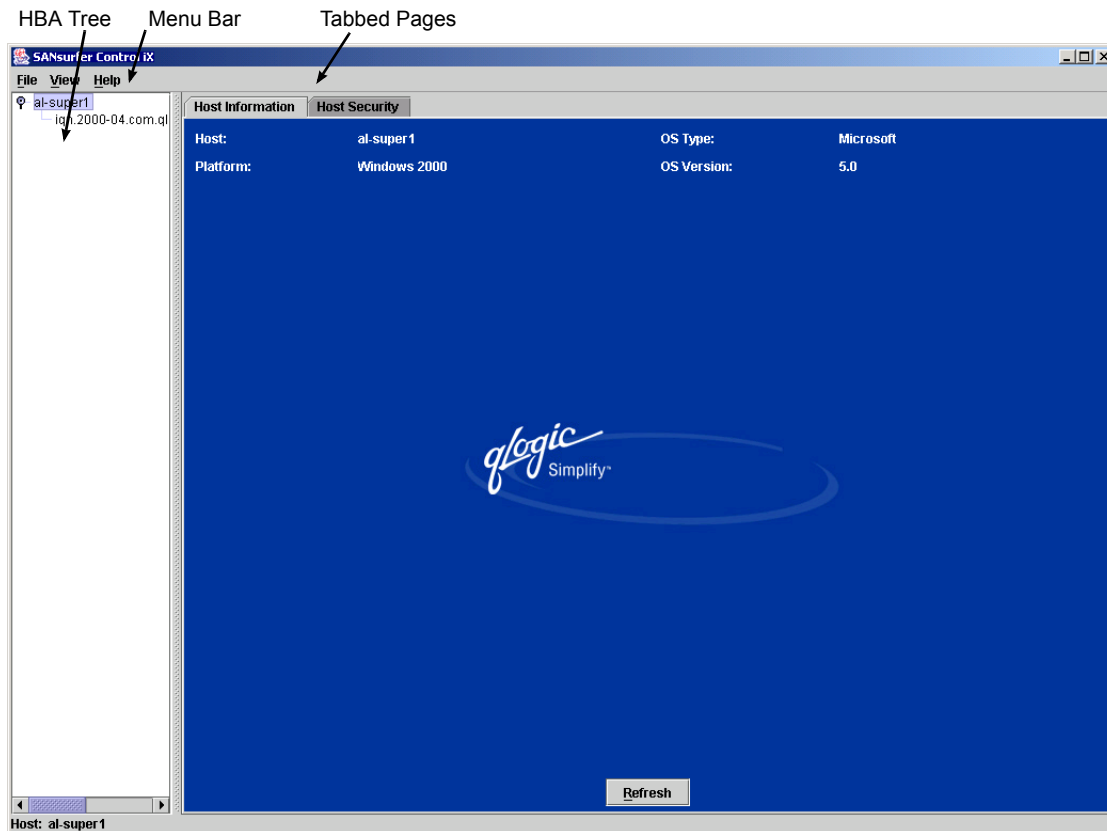


Figure 6-8. Host Information Tabbed Page (Main Window)

The **Host Information** tabbed page provides the following information about the local machine (host):

- Host name
- OS type
- Platform
- OS version

The main window consists of the following sections:

- Menu bar
- HBA tree
- Tabbed pages

The menu bar has three options:

■ **File**

- **Exit.** Select this option to exit SANsurfer Control iX.

■ **View**

- **Refresh.** Select this option to refresh the information displayed by SANsurfer Control iX.
- **Preferences.** Select this option to choose the platform style of the information displayed by SANsurfer Control iX.

■ **Help**

- **Set Browser Location.** Select this option to set the specify the location of the browser SANsurfer Control iX launches when you select **Browse Contents** from the **Help** menu.
- **Browse Contents.** Selection this option to view the online help.
- **About.** Select this option to see the current version of SANsurfer Control iX.

The HBA tree displays the hosts with their connected adapters, devices, and LUNs. The HBAs (adapters) are displayed with their iSCSI name.

Each HBA on the host may have targets connected to it. If an HBA is connected to a target, it has a button attached to the left. The HBA name can be expanded by clicking the button. This lists all the devices connected to that HBA. The devices are listed by their IP address or iSCSI name.

To view target information, click the target in the HBA tree. The **Target Information** tabbed page displays (see figure 6-9).

Target Information		LUN List	
HBA Type:	QLA4010	HBA Alias Name:	
HBA Instance:	0	IP Address:	192. 168. 3. 1
HBA iSCSI Name:	iqn.2000-04.com.qlogic:qla4010.ds20331a00238		
Vendor:	SEAGATE	Product Revision:	0002
Product ID:	ST318304FC	Target Alias Name:	RT1-79fa
Target iSCSI Name:	iqn.1987-05.com.cisco:00.898900ec8900.RT1-79fa		

Figure 6-9. Target Information Tabbed Page

Clicking the button attached to a target further expands the tree and shows all the LUNs in that device. The LUNs are listed with the corresponding LUN numbers.

To view LUN information, click the LUN in the HBA tree, or click the LUN List tab if the **Target Information** tabbed page is already displayed. The **LUN List** tabbed page displays (see figure 6-10).

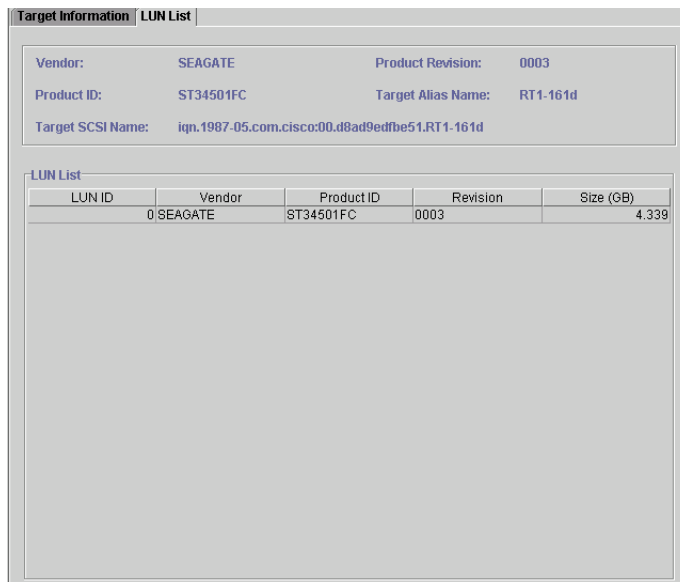


Figure 6-10. LUN List Tabbed Page

The right-hand side of the screen contains a series of tabbed pages, which change depending on what is selected in the HBA tree. When SANsurfer Control iX starts, the **Host Information** tabbed page displays.

Different tabbed pages appear when you click on an adapter name, a target, or a LUN in the HBA tree. These pages are described in [sections 6.3.2.1](#) through [6.3.2.5](#).

6.3.2.1

Host Tabbed Page

When SANSurfer Control iX starts, the first screen is the main window, which defaults to the **Host Information** tabbed page (see figure 6-11).

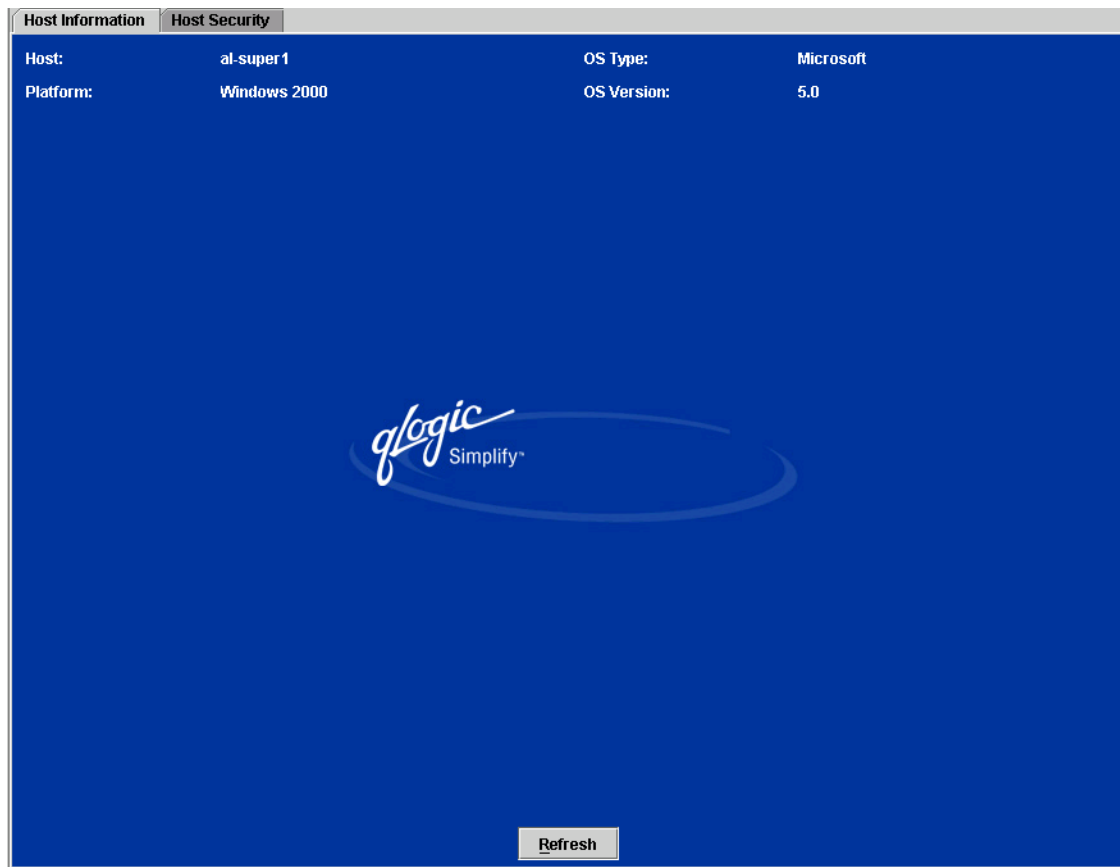


Figure 6-11. Host Information Tabbed Page

The **Host Information** tabbed page provides the following information about the local machine (host):

- Host name
- OS type
- Platform
- OS version

6.3.2.2

HBA Tabbed Pages

Use the **HBA Options** tabbed page first to set basic QLA4010/4010C HBA information, such as IP address, iSCSI alias, etc. The **Firmware** and **Network** tabbed pages enable you to configure the QLA4010/4010C HBA (see [figures 6-12](#) and [6-13](#)). For more information, see [section 6.4](#).

The screenshot displays the 'HBA Options' tabbed page in the SANsurfer Control iX interface. The 'Firmware' tab is selected. The top section contains configuration fields: 'HBA Type' is set to 'QLA4010', 'HBA Instance' is '0', 'HBA iSCSI Name' is 'iqn.2000-04.com.qlogic:qla4010.ds20331a00238', 'HBA Alias Name' is an empty field, and 'IP Address' is '192.168.3.1'. Below these fields are two tabs: 'Network' and 'Firmware'. The 'Firmware' tab is active, showing several buttons: 'Open' for 'Configured Firmware Values', 'Restore' for 'Restore Factory Defaults', 'Select Firmware to Download' for 'Update HBA with new Firmware:', 'Select ROM to Download' for 'Update HBA with new ROM:', and 'Retrieve Crash Record' for 'Retrieve HBA Crash Record:'. At the bottom of the page are 'Refresh' and 'Save' buttons.

Figure 6-12. HBA Options Tabbed Page (Firmware)

The screenshot shows the 'HBA Options' tabbed page with the 'Network' sub-tab selected. The main configuration area is divided into two columns. The left column contains options for IP address configuration: 'Obtain an IP address automatically (DHCP)' (unchecked), 'Use the following IP address:' (checked), and fields for IP Address (192.168.3.1), Subnet Mask (255.255.0.0), and Gateway (0.0.0.0). The right column contains options for DNS server configuration: 'Obtain DNS server address automatically (via DHCP)' (unchecked), 'Use the following DNS server addresses:' (checked), and fields for Primary DNS (10.1.3.31) and Secondary DNS (0.0.0.0). Below these are sections for SLP and iSNS configuration, each with 'Enable' checkboxes and options for automatic or manual address discovery. At the bottom are 'Refresh' and 'Save' buttons.

Figure 6-13. HBA Options Tabbed Page (Network)

6.3.2.3 Target Settings Tabbed Page

Target Settings is the primary tabbed page for interactive use. Use this page to configure iSCSI targets (see figure 6-14).

The screenshot shows the 'Target Settings' tabbed page. It features a table of discovered iSCSI targets with columns: Bind, Enable Target, Dynamic, IP Address, Port, iSCSI Name, Target ID, Alias, and State. The table lists 8 targets, all with 'Session Active' status. Below the table are checkboxes for 'Auto-bind Discovered Targets' and 'Auto-discover targets (Re-discover on Save)', both of which are checked. At the bottom are buttons for 'Config Parameters', 'Config Authentication', 'Refresh', and 'Save'.

Bind	Enable Target	Dynamic	IP Address	Port	iSCSI Name	Target ID	Alias	State
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	192.168.1.31	3260		0		No Connection Active
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.1.31	3260	iqn.1987-05.com.cisco.00...	64 RT1-161d		Session Active
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.1.31	3260	iqn.1987-05.com.cisco.00...	65 rt1-074d		Session Active
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.1.31	3260	iqn.1987-05.com.cisco.00...	66 RT1-79fa		Session Active
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.1.31	3260	iqn.1987-05.com.cisco.00...	67 RT1-edf4		Session Active
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.1.31	3260	iqn.1987-05.com.cisco.00...	68 RT1-114a		Session Active
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.1.31	3260	iqn.1987-05.com.cisco.00...	69 RT1-1b56		Session Active
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.1.31	3260	iqn.1987-05.com.cisco.00...	70 RT1-ee30		Session Active

Figure 6-14. Target Settings Tabbed Page

6.3.2.4

Target Information Tabbed Page

The **Target Information** tabbed page provides information about iSCSI targets (you cannot configure iSCSI targets on this page) ([see figure 6-15](#)).

HBA Options | **Target Settings** | **Target Information** | **HBA Information** | **Statistics** | **Diagnostics**

HBA Type: QLA4010 HBA Alias Name:
HBA Instance: 0 IP Address: 192. 168. 3. 1
HBA iSCSI Name: iqn.2000-04.com.qlogic.qla4010.ds20331a00238

Select Target: 192.168.1.31:3260 RT1-edf4 Note: Only Saved Target information is available

Parameter	Negotiated Values for Saved Targets
iSCSI Name	iqn.1987-05.com.cisco.00.e073d7678acf.RT1-edf4
Target ID	67
Options	
-Reserved	
-Active	True
-Access Granted	False
-Target Entry	True
-Initiator Entry	False
RetryCount	0
RetryDelay	0
DevType	0
ExeThrottle	16
FirstBurstLen	128
IPOptions	
-Reserved	
-Fragmentation	Enabled
iSCSIOptions	
-Receive Markers	Disabled
-Send Markers	Disabled
-Header Digests	Disabled
-Data Digests	Disabled
-Immediate Data	Enabled
-Initial R2T	Enabled
-Data Sequence In Order	Enabled
-Data PDU In Order	Enabled
-CHAP Authentication	Disabled
-Bidirectional Authentication	Disabled
-Snack	Disabled

Refresh

Figure 6-15. Target Information Tabbed Page

6.3.2.5

HBA Information Tabbed Page

The **HBA Information** tabbed page is for information only. It provides code versions, etc. (see figure 6-16).

The screenshot displays the 'HBA Information' tab within the SANsurfer Control iX interface. The page is organized into two main sections: a top summary section and a larger 'General Information' section below it. The top section contains fields for HBA Type (QLA4010), HBA Instance (0), HBA iSCSI Name (iqn.2000-04.com.qlogic:qla4010.ds20331a00238), HBA Alias Name, and IP Address (192.168.3.1). The 'General Information' section is divided into two columns of data. The left column lists Serial Number (DS20331A00238), MAC Address (00-C0-DD-00-F6-80), Driver Version (2.0.2.0 Beta1 DBG(SCSI)), Firmware Version (1.0.0.2), ROM Version (0.3.0.3), and iSCSI Version (0.20). The right column lists Connection Type (Copper), Board Type (QLA4010 HBA), and Chip Version (3). A 'Refresh' button is located at the bottom center of the page.

HBA Options		Target Settings		Target Information		HBA Information		Statistics		Diagnostics	
HBA Type:	QLA4010					HBA Alias Name:					
HBA Instance:	0					IP Address:	192.	168.	3.	1	
HBA iSCSI Name:	iqn.2000-04.com.qlogic:qla4010.ds20331a00238										
General Information											
Serial Number:	DS20331A00238					Connection Type:	Copper				
MAC Address:	00-C0-DD-00-F6-80					Board Type:	QLA4010 HBA				
Driver Version:	2.0.2.0 Beta1 DBG(SCSI)					Chip Version:	3				
Firmware Version:	1.0.0.2										
ROM Version:	0.3.0.3										
iSCSI Version:	0.20										
<div>Refresh</div>											

Figure 6-16. HBA Information Tabbed Page

6.3.2.7

Diagnostics Tabbed Page

The diagnostics tabbed page allows you to ping an IP address with a specified number of packets (see [figure 6-18](#)), as well as view the ARP log and connection error log files. See [section 6.7](#) for more information.

The screenshot shows the 'Diagnostics' tab in the SANsurfer Control iX interface. At the top, there are tabs for 'HBA Options', 'Target Settings', 'Target Information', 'HBA Information', 'Statistics', and 'Diagnostics'. Below these tabs, the following information is displayed:

- HBA Type: QLA4010
- HBA Instance: 0
- HBA iSCSI Name: iqn.2000-04.com.qlogic:qla4010.ds20331a00238
- HBA Alias Name:
- IP Address: 192.168.3.1

Below this information, there are two sub-tabs: 'Ping' and 'Logs'. The 'Ping' sub-tab is selected. It contains the following fields:

- IP: 0.0.0.0
- Number of packet(s) (1-10000): 1

At the bottom of the 'Ping' sub-tab, there are two buttons: 'Start testing' and 'Stop testing'.

Figure 6-18. Diagnostics Tabbed Page (Ping)

The screenshot shows the 'Diagnostics' tab in the SANsurfer Control iX interface. At the top, there are tabs for 'HBA Options', 'Target Settings', 'Target Information', 'HBA Information', 'Statistics', and 'Diagnostics'. Below these tabs, the following information is displayed:

- HBA Type: QLA4010
- HBA Instance: 0
- HBA iSCSI Name: iqn.2000-04.com.qlogic:qla4010.ds20331a00238
- HBA Alias Name:
- IP Address: 192.168.3.1

Below this information, there are two sub-tabs: 'Ping' and 'Logs'. The 'Logs' sub-tab is selected. It contains the following fields:

- Log of the ARP cache table for this HBA:
- Log of 100 latest connection errors for this HBA:

Below these fields, there are two buttons: 'Display ARP Table' and 'Display Connection Errors'.

At the bottom of the 'Logs' sub-tab, there are two buttons: 'Start testing' and 'Stop testing'.

Figure 6-19. Diagnostics Tabbed Page (Log)

6.3.3

Exiting the SANsurfer Control iX GUI

Do one of the following to exit the SANsurfer Control iX GUI:

- On the SANsurfer Control iX main window **File** menu, select **Exit**.
- Click the close (x) button in the upper right-hand corner of the screen.

6.3.4

Getting Help with the SANsurfer Control iX GUI

This section discusses:

- Viewing online help ([see section 6.3.4.1](#))
- Specifying the browser location ([see section 6.3.4.2](#))
- Viewing SANsurfer Control iX software information ([see section 6.3.4.3](#))

6.3.4.1

Viewing Online Help

NOTE: You must have Adobe Acrobat® Reader® installed on your PC to view the online help.

On the SANsurfer Control iX main window **Help** menu, click **Browse Contents** to view the online help. The help document (in PDF format) displays.

6.3.4.2

Specifying the Browser Location

Perform the following steps to specify the location of the browser SANsurfer Control iX launches when you select to view the online help ([see section 6.3.4.1](#)):

1. On the SANsurfer Control iX main window **Help** menu, click **Set Browser Location**. The **Browser Location** dialog box displays ([see figure 6-20](#)).

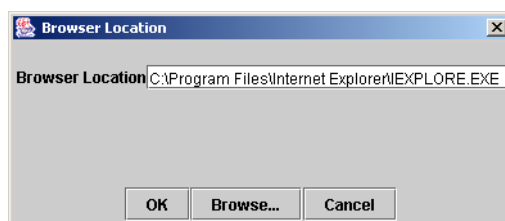


Figure 6-20. Browser Location Dialog Box

2. In the **Browser Location** box, enter the location. Be sure to specify the path and file name.

If you do not know the location, click **Browse** to display a file selection dialog. Select the file. The **Browser Location** dialog box re-displays.

3. Do one of the following:
 - ☐ Click **OK** to save the location to the SANsurfer Control iX configuration file.
 - ☐ Click **Cancel** to exit the **Browser Location** dialog box without making changes.

6.3.4.3

Viewing SANsurfer Control iX Software Information

To view information about the SANsurfer Control iX application software, on the SANsurfer Control iX main window **Help** menu, click **About**.

The **About SANsurfer Control iX** window displays (see figure 6-21).

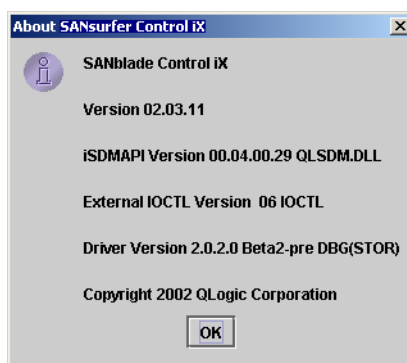


Figure 6-21. About SANsurfer Control iX Window

This window displays the following information:

- Version number
- ISDMAPI version number
- External IOCTL version number
- Driver version number

Click **OK** to return to the SANsurfer Control iX main window.

6.3.5

Setting SANsurfer Control iX Security

SANsurfer Control iX security ensures that adapter configuration changes require password authorization. SANsurfer Control iX prompts for the password any time you click the **Save** button to change the HBA configuration.

You can change the SANsurfer Control iX application access password for any host connected to your system for which you have administrator or root privileges.

NOTE: The default SANsurfer Control iX application access password is *config*. Change this password after installation to ensure that security is not compromised.

Perform the following steps to set the application access password for a host:

1. In the SANsurfer Control iX main window HBA tree, select the host for which you want to set the application access password.
2. Click the **Host Security** tab. The **Host Security** tabbed page displays (see [figure 6-22](#)). The host name displays at the top of the tabbed page.

Figure 6-22. Host Security Tabbed Page

3. In the Update Application Configuration Access section, do the following to modify the SANsurfer Control iX application access password:
 - a. In the **Old Password** box, type the current password.
 - b. In the **New Password** box, type the new password.
 - c. In the **Verify Password** box, type the new password again to confirm the new password.
4. Do one of the following:
 - ❑ Click **Apply** to update the application access password.
 - ❑ Click **Clear Fields** to clear the typed entries in the **Host Security** tabbed page text boxes.

6.4

Configuring the QLA4010/4010C HBA

The following sections provide instructions on how to configure the QLA4010/4010C HBA:

- Setting the IP address (see section 6.4.1)
- Setting the domain name system (DNS) server address (see section 6.4.2)
- Enabling service locator protocol (SLP) (see section 6.4.3)
- Enabling internet storage name service (iSNS) (see section 6.4.4)

NOTE: You must configure the QLA4010/4010C HBA before you can configure targets, edit target and firmware configuration parameters, or perform a firmware upgrade.

Perform the following steps to access the configuration options, located on the **HBA Options** tabbed page.

1. Select an HBA in the HBA tree.
2. Click the **HBA Options** tab. The HBA Options tabbed page displays.

The screenshot shows the 'HBA Options' tabbed page with the 'Network' sub-tab selected. The page is divided into several sections for configuration:

- Header:** HBA Type: QLA4010, HBA Alias Name: (empty), HBA Instance: 0, IP Address: 192.168.3.1, HBA iSCSI Name: lqn.2000-04.com.qlogic:qla4010.ds20331a00238
- Network Section:**
 - ☐ Obtain an IP address automatically (DHCP)
 - ☒ Use the following IP address:
 - IP Address: 192.168.3.1
 - Subnet Mask: 255.255.0.0
 - Gateway: 0.0.0.0
 - ☐ Obtain DNS server address automatically (via DHCP)
 - ☒ Use the following DNS server addresses:
 - Primary DNS: 10.1.3.31
 - Secondary DNS: 0.0.0.0
- SLP and iSNS Section:**
 - ☐ Enable SLP
 - ☐ Obtain DA address automatically (via DHCP)
 - ☒ Use the following DA address: DA Address: 0.0.0.0
 - ☐ Discover DA
 - ☐ Enable iSNS
 - ☐ Obtain iSNS server address automatically (via DHCP)
 - ☒ Use the following iSNS server address
 - IP Address: 0.0.0.0
 - Hostname: (empty)

At the bottom are 'Refresh' and 'Save' buttons.

Figure 6-23. HBA Tabbed Page (Network)

- a. Entering a name in the **HBA Alias** box is optional (the default is none).
- b. Entering a name in the **HBA iSCSI Name** box is optional (the default is the iSCSI standard).

3. Configure the HBA as described in the following sections. When configuration is complete, click **Save**.

After configuring the QLA4010/4010C, you can configure targets ([see section 6.5](#)), configure the firmware ([see section 6.6](#)), and run diagnostics ([see section 6.7](#)).

6.4.1

Setting the IP Address

There are two ways to set the IP address, as described in the following sections:

- Automatically (through dynamic host configuration protocol (DHCP)) ([see section 6.4.1.1](#))
- Manually ([see section 6.4.1.2](#))

6.4.1.1

Setting the IP Address Automatically

To set the IP address automatically through DHCP, select the **Obtain an IP address automatically (DHCP)** radio button.

6.4.1.2

Setting the IP Address Manually

To set the IP address manually, perform the following steps:

1. Select the **Use the following IP address** radio button.
2. Enter the IP address.
3. Enter the subnet mask.
4. Enter the gateway.

6.4.2

Setting the DNS Server Address

There are two ways to set the DNS server address, as described in the following sections:

- Automatically (through dynamic host configuration protocol (DHCP)) ([see section 6.4.2.1](#))
- Manually ([see section 6.4.2.2](#))

6.4.2.1

Setting the DNS Server Address Automatically

NOTE: You must select the **Obtain an IP address automatically (DHCP)** radio button to set the DNS server address automatically.

To set the DNS server address automatically through DHCP, select the **Obtain DNS server address automatically (via DHCP)** radio button.

6.4.2.2

Setting the DNS Server Address Manually

To set the DNS server address manually, perform the following steps:

1. Select the **Use the following DNS server address** radio button.
2. Enter the **Preliminary DNS IP** address.

NOTE: At the time of publication, the **Secondary DNS IP** address field is not supported.

6.4.3

Enabling SLP

Perform the following steps to enable SLP:

1. Select the **Enable SLP** check box.
2. Set the directory agent (DA) address automatically, manually, or through the discovery process:
 - a. Select the **Obtain DA address automatically (via DHCP)** radio button to set the DA address automatically.
 - b. Select the **Use the following DA address** radio button to set the DA address manually. Enter the DA address.
 - c. Select the **Discover DA** radio button to find the DA address using the discovery process.

6.4.4

Enabling iSNS

NOTE: This feature is not supported on Red Hat Linux systems.

Perform the following steps to enable iSNS:

1. Select the **Enable iSNS** check box.
2. Set the iSNS server address automatically or manually:
 - a. Select the **Obtain iSNS server address automatically (via DHCP)** radio button to set the iSNS server address automatically.
 - b. Select the **Use the following iSNS server address** to set the iSNS server address manually. Enter the IP address.

NOTE: At the time of publication, the **Hostname** field is not supported.

6.5

Configuring Targets

After configuring the QLA4010/4010C HBA, you can enter iSCSI targets you want to discover. Start SANsurfer Control iX ([see section 6.2](#)), select your host and HBA, then click the **Target Settings** tab. When the QLA4010/4010C HBA arrives from the factory, there are no targets listed. Add iSCSI targets by either entering specific iSCSI target information (IP address and iSCSI name, [see section 6.5.2](#)) or by entering an IP address and *discovering* the devices behind that address ([see section 6.5.1](#)).

If you want the targets to be bound to the QLA4010/4010C HBA, select the **Auto-bind Discovered Targets** check box. All targets, whether entered manually or found using discovery, will be automatically bound to the HBA (the check box in the **Bind** column will be selected) when the target configuration is saved.

6.5.1

Configuring Using Discovery

Use the discovery mechanism to configure a target that supports and responds to the SendTargets command by following these steps:

1. Start SANsurfer Control iX, select your host and QLA4010/4010C HBA, then click the **Target Settings** tab.
2. Click the first available line under **IP Address** ([see figure 6-14](#)).
3. Enter the IP address of the target to which you want to connect. This target must support the SendTargets command.
4. Leave the iSCSI Name field blank.
5. If you want all of the discovered targets to be restored when the QLA4010/4010C HBA is reset, select the **Auto-discover targets (Rediscover on Save)** check box.
6. Click **Save**. The QLA4010/4010C HBA does the following:
 - a. Resets (reboots the HBA only) if you have made changes to the firmware configuration parameters in [section 6.6.1](#).
 - b. Connects to the target
 - c. Queries the target through a SendTargets command
 - d. Discovers all devices allowed by the target
 - e. Shows the targets as dynamic (the **Dynamic** (read only) check box is selected).

- f. Selects the **Bind** check box is if the **Auto-bind Discovered Targets** check box was selected.
 - g. Makes these new targets available on the SANsurfer Control iX **Target Settings** tabbed page
7. If you want to enable the target, select the check box in the **Enable Target** column associated with the target. If you want to enable all the targets, right-click on any target in the table and select **Enable All Devices** from the pop-up menu. Conversely, select **Disable All Devices** if you do not want to enable any target.

If this check box is not selected, the target is visible, but not accessible, to the HBA.
 8. If you want to bind the target to the HBA (the **Auto-bind Discovered Targets** check box was not selected), select the check box in the **Bind** column associated with the target. If you want to bind all the targets to the HBA, right-click any target in the table and select **Bind All**. Conversely, select **UnBind All** if you do not want to bind any targets to the HBA.
 9. If you want to change any of the configuration parameters, follow the instructions in [section 6.5.3](#).
 10. Click **Save**.
 11. QLogic recommends restarting the host PC for the operating system to recognize the new targets.

The discovery method is an excellent timesaver for finding and entering iSCSI targets. You can use this method to find all available targets, delete targets you do not want, and then have access only to the remaining devices. This method prevents you from having to enter iSCSI names for each target. In the following example, there is an iSCSI target at IP address 10.14.64.150. Behind this target are two available drives with iSCSI alias' Drive1 and Drive2.

1. On the **Target Settings** tabbed page, under **IP Address**, enter IP address 10.14.64.150.
2. Leave the **iSCSI Name** field blank.
3. Click **Save**.
4. Click the **Target Settings** tab.

The following three targets appear:

- ☐ IP address 10.14.64.150
 - ☐ IP address 10.14.64.150 with iSCSI alias Drive1
 - ☐ IP address 10.14.64.150 with iSCSI alias Drive2
5. Restart the host PC for the operating system to recognize the new targets.

CAUTION! The iSCSI port number defaults to 3260. Do not change this number unless required by the configured target.

6.5.2

Configuring Specific Targets

To configure a specific iSCSI target, follow these steps:

1. Start SANsurfer Control iX, select your host and QLA4010/4010C HBA, then click the **Target Settings** tab.
2. Click green plus sign on the right-hand side of the screen (see figure 6-14).
3. Double-click the **IP Address** column. Enter the IP address of the target to which you want to connect.
4. Double-click the **iSCSI Name** column. Enter the iSCSI name of the target.
5. If you want to enable the target, select the check box in the **Enable Target** column associated with the target. If this check box is not selected, the target is visible, but not accessible, to the HBA.
6. If you want to bind the target to the HBA (the **Auto-bind Discovered Targets** check box was not selected), select the box in the **Bind** column associated with the target.
7. Enter other targets as desired.
8. If you want all of the targets to be restored when the HBA is reset, select the **Auto-discover targets (Rediscover on Save)** check box.
9. If you want to change any of the configuration parameters, follow the instructions in section 6.5.3.
10. Do one of the following:
 - a. Click **Save**. The QLA4010/4010C HBA does the following:
 - ☐ Resets (reboots the HBA only) if you have made changes to the firmware configuration parameters in section 6.6.1.
 - ☐ Connects to the target
 - ☐ Makes these new targets available on the SANsurfer Control iX **Target Settings** tabbed page
 - b. Right-click the target and select **Login/Save Device**. Enter your password at the prompt. The QLA4010 logs into (*same as connects?*) to the specific target and saves this configuration. *Why would they do this instead of clicking Save?*
 - c. If you want to log out, then reconnect to the target, right-click the target and select **Logout/Reconnect**. Enter your password at the prompt.

11. QLogic recommends restarting the host PC for the operating system to recognize the new targets.
12. The QLA4010/4010C HBA restarts and attempts to connect to the configured targets.

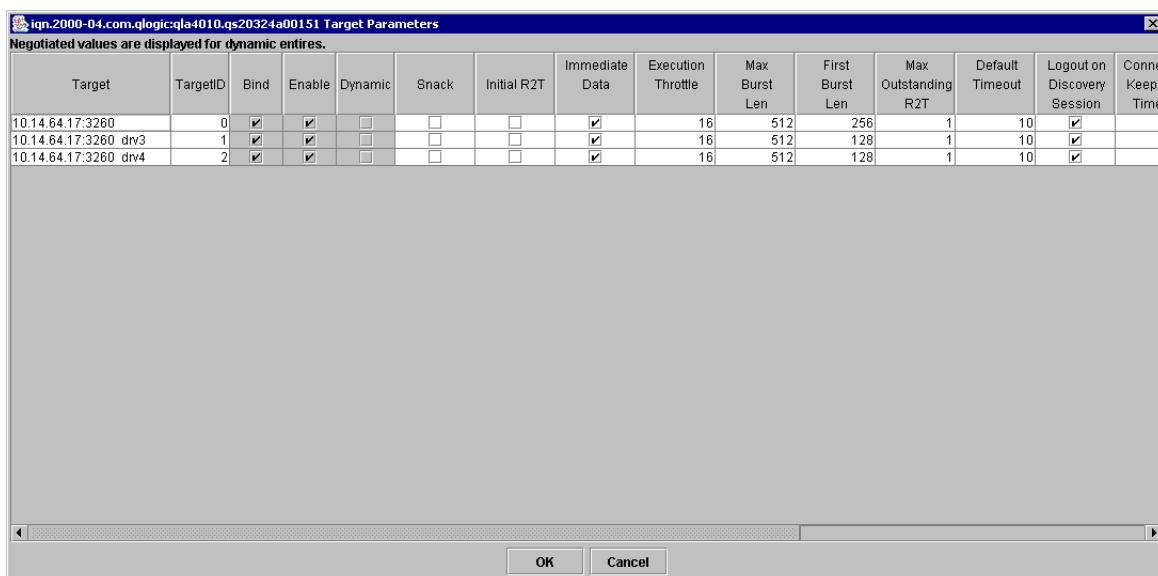
6.5.3

Changing the Target Configuration Parameters

NOTE: If you changed the firmware configuration parameters (see section 6.6.1), a subset of those settings appear for the corresponding target configuration parameters. Changing the target configuration parameters will not change the corresponding firmware configuration parameters.

Perform the following steps to edit the target configuration parameters:

1. Click the desired adapter in the HBA tree.
2. Click the **Target Settings** tab.
3. Click **Config Parameters**. The Target Parameters screen displays (see figure 6-24).



Target	TargetID	Bind	Enable	Dynamic	Snack	Initial R2T	Immediate Data	Execution Throttle	Max Burst Len	First Burst Len	Max Outstanding R2T	Default Timeout	Logout on Discovery Session	Conn. Keep. Time
10.14.64.17:3260	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16	512	256	1	10	<input checked="" type="checkbox"/>	
10.14.64.17:3260 drv3	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16	512	128	1	10	<input checked="" type="checkbox"/>	
10.14.64.17:3260 drv4	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16	512	128	1	10	<input checked="" type="checkbox"/>	

Figure 6-24. Target Parameters

4. Select and change the desired parameters. See section 6.6.1 for descriptions of the parameters; they are a subset of the firmware configuration parameters except for the following parameters.
 - ☐ **Bind.** When the check box is selected in this read-only field, the target is bound to the QLA4010/4010C.

- ❑ **Enable.** When the check box is selected in this read-only field, the target is visible and accessible to the QLA4010/4010C. When this check box is not selected, the target is visible, but not accessible, to the QLA4010/4010C.
 - ❑ **Dynamic.** When the check box is selected in this read-only field, the target has been identified, but is not yet visible or accessible to the QLA4010/4010C.
 - ❑ **Default Timeout.** This column indicates the timeout interval that the QLA4010/4010C firmware uses for timing out commands or PDUs created and transmitted by the QLA4010/4010C that are not related to an IOCB. For example, in session mode the firmware generates Login Command and Text Command PDUs. These PDUs are not related to an IOCB; therefore, they have no inherent timeout value. In this case, the firmware uses the value specified in this column as the timeout interval for the Login Command and Text Command PDUs. The firmware also uses the timeout interval specified in this field for timing out Task Management commands that are generated by the firmware as part of error recovery or in response to a mailbox command that results in a Task Management command. The default value for this column is 10 seconds. Valid values are in the range 0–65535.
5. When you are done changing the parameters, click **OK**. A message is displayed indicating that these changes will be saved when you click **Save** on the **Target Settings** tabbed page.

6.5.4

Authenticating Targets (CHAP)

The ISP4010 firmware utilizes the challenge handshake authentication protocol (CHAP) as an authentication mechanism between the iSCSI initiators (QLA4010/4010C HBAs) and the devices to which they are attached (targets). Authentication can be disabled or enabled for a specific target or for all targets attached to the QLA4010/4010C HBA.

NOTE: The targets attached to the QLA4010/4010C HBA must be programmed for or support CHAP.

Perform the following steps to set up CHAP for the QLA4010/4010C HBA and the attached targets:

1. Select an HBA from the HBA tree.
2. Click the **Target Settings** tab.
3. Click **Config Authentication**.

4. At the prompt, enter your password. The **CHAP** tabbed page displays (see [figure 6-25](#)).

Figure 6-25. CHAP Tabbed Page

5. Select the **Enable** check box for the targets for which you want to use CHAP.
6. Enter the initiator name and secret you want to use in the **Initiator Name** and **Initiator Secret** columns.
7. CHAP is now enabled; the target will use CHAP to authenticate the QLA4010/4010C HBA. If you also want the QLA4010/4010C HBA (initiator) to authenticate the target, perform the following steps:
 - a. Select the **Bidi** check box of the target you want to configure.
 - b. In the **Target Table** portion of the page, click the green plus sign (+) on the right. A blank row displays.
 - c. Double-click the row in the **Target Name** column. Enter the target name, which can be a maximum of 256 ASCII characters. This name must be entered on the target side (Name) for bidirectional CHAP.
 - d. Double-click the row in the **Target Secret** column. Enter the target secret, which can be a maximum of 100 ASCII characters. This target secret must be entered on the target side (Password) for bidirectional CHAP.
 - e. Repeat [steps a](#) through [d](#) for each target you want to configure. If you want to remove a target from the **Target Table**, click the row you want to remove, then click the minus sign (–) on the right.

8. If the enabled targets are configured to use the same initiator name and secret, perform the following steps. Otherwise, skip to [step 9](#).
 - a. Select the **Set Default Initiator Name and Secret** box. The **Initiator Name and Secret** part of the page becomes inactive (you cannot specify different names and secrets for each target).
 - b. Type the QLA4010/4010C HBA (initiator) name and secret in the **Name** and **Secret** fields in the **Initiator** portion of the page. The name can be a maximum of 256 ASCII characters; the secret can be a maximum of 100 ASCII characters. The name and secret are automatically entered in the **Initiator Name and Secret** part of the page.
9. If the enabled targets are configured to use different initiator names and secrets, perform the following steps:
 - a. In the **Initiator Name and Secret** part of the page, double-click the **Initiator Name** field in the row of the target you want to program. Type in the name, which can be a maximum of 256 ASCII characters.
 - b. In the **Initiator Name and Secret** part of the page, double-click the **Initiator Secret** field in the row of the target you want to program. Type in the name, which can be a maximum of 100 ASCII characters.
10. Click **OK**.

6.6

Configuring the Firmware

This section describes how to do the following:

- Change the configured firmware values ([see section 6.6.1](#))
- Restore the factory defaults
- Update the HBA with new firmware
- Update the HBA with new ROM
- Retrieve the HBA crash record

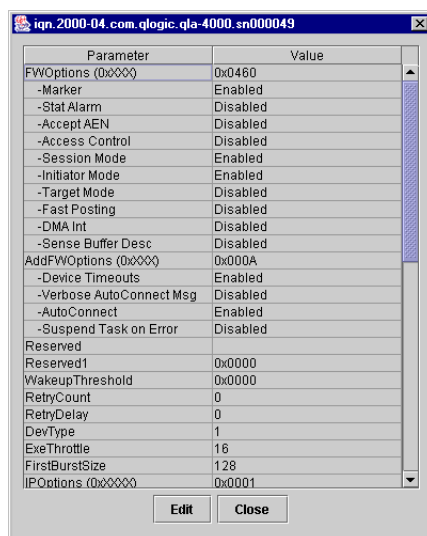
6.6.1

Changing the Firmware Configuration Parameters

Perform the following steps to edit the firmware configuration parameters:

1. Click the desired adapter in the HBA tree. By default, the **HBA Options** tabbed page displays.
2. Click the **Firmware** tab.

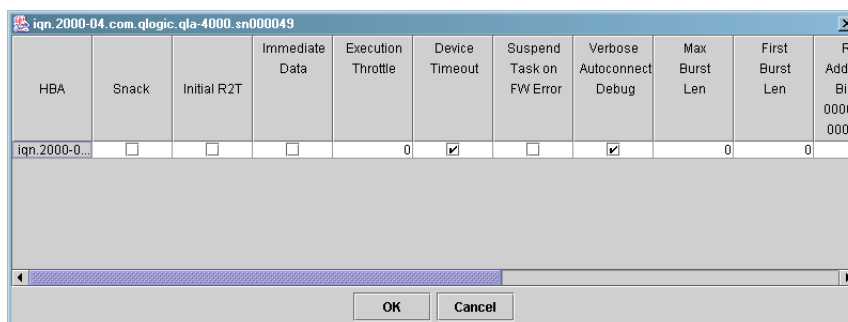
- Next to the phrase **Configured Firmware Values**, click **Open**. A read-only table displays, listing all of the firmware values and their current settings (see figure 6-26).



Parameter	Value
FWOptions (0x000)	0x0480
-Marker	Enabled
-Stat Alarm	Disabled
-Accept AEN	Disabled
-Access Control	Disabled
-Session Mode	Enabled
-Initiator Mode	Enabled
-Target Mode	Disabled
-Fast Posting	Disabled
-DMA Int	Disabled
-Sense Buffer Desc	Disabled
AddFWOptions (0x000)	0x000A
-Device Timeouts	Enabled
-Verbose AutoConnect Msg	Disabled
-AutoConnect	Enabled
-Suspend Task on Error	Disabled
Reserved	
Reserved1	0x0000
WakeupThreshold	0x0000
RetryCount	0
RetryDelay	0
DevType	1
ExeThrottle	16
FirstBurstSize	128
IPOptions (0x0000)	0x0001

Figure 6-26. Firmware Parameters Table (Read Only)

- To change a subset of these values, click **Edit**. A dialog box displays with the parameters that can be changed (see figure 6-27).



HBA	Snack	Initial R2T	Immediate Data	Execution Throttle	Device Timeout	Suspend Task on FW Error	Verbose Autoconnect Debug	Max Burst Len	First Burst Len	RS AddF Bin 0000 000-
iqn.2000-0...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	0	

Figure 6-27. Firmware Parameters Dialog Box

- Select and change the desired parameters, explained in the following paragraphs. To view the full name of the parameter, point the mouse to the

parameter column. When you are done changing the parameters, click **OK**. The following message displays:

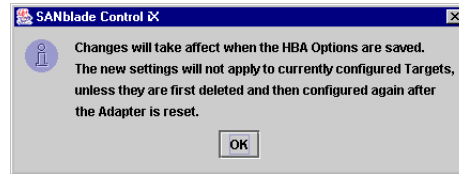


Figure 6-28. Save Firmware Parameters Message

Click **OK**.

- ❑ **Snack.** When this check box is set and the firmware is configured as an initiator, the QLA4010/4010C firmware sends SNACK requests to the target when it detects missing PDUs. When this check box is cleared and the firmware is configured as an initiator, the firmware aborts the command and/or closes the connection when missing PDUs are detected.
- ❑ **Initial R2T.** When this check box is selected, the QLA4010/4010C HBA negotiates (during login phase) for InitialR2T=yes. When this check box is cleared, initial R2T is disabled and the QLA4010/4010C HBA negotiates for InitialR2T=no.
- ❑ **Immediate Data.** When this check box is selected, the QLA4010/4010C firmware negotiates (during login phase) for Immediate Data=yes. When this check box is cleared, immediate data is disabled and the firmware negotiates for ImmediateData=no.
- ❑ **Execution Throttle.** This column specifies the execution throttle value. The execution throttle is used by the QLA4010/4010C firmware to limit the number of concurrently executing commands. Valid values are in the range 0–65535.

In target mode, this column is used by the QLA4010/4010C to determine the MaxCmdSN (maximum command sequence number) to report to an initiator during a logged in iSCSI session.

In initiator mode, when this value is nonzero, the firmware limits the number of outstanding commands to the smaller of this value and the number of commands advertised by the target's MaxCmdSN value.

- ❑ **Device Timeout.** When this check box is selected, the QLA4010/4010C firmware ignores the IOCB command timeout values specified by the host.

- ❑ **MaxBurstLength.** This column indicates the maximum length for data sequences the QLA4010/4010C uses when negotiating with a device during login phase. This parameter indicates how many units (512 bytes/unit) of data the QLA4010/4010C can send/receive. Valid values are in the range 0 to 32767 units (512 to 16 MB–1 bytes); a value of 0 indicates unlimited data units.
- ❑ **FirstBurstLength.** This column indicates the maximum length for unsolicited data the QLA4010/4010C uses when negotiating with a device during the login phase. This parameter indicates how many units (512 bytes/unit) of unsolicited data the QLA4010/4010C can send/receive. Valid values are in the range 0 to 32767 units (512 to 16 MB–1 bytes); a value of 0 indicates unlimited data units.
- ❑ **RSVAddFWOpBinary.** This field is used for debug and test purposes. Contact QLogic for more information.
- ❑ **Jumbo Packets Enable.** When this check box is selected, jumbo packets are enabled on an Ethernet network. This feature is not currently supported.
- ❑ **Autoconnect.** When this check box is selected, the QLA4010/4010C will not attempt to autoconnect to the configured target devices at boot time. Instead, the host must issue Set Device Database Entry commands (0063h) to establish connections to targets.
- ❑ **MaxOutstanding R2T.** This column indicates the maximum number of outstanding R2Ts the QLA4010/4010C uses when negotiating with a device during the login phase. This parameter indicates how many R2Ts can be outstanding on a SCSI task. Valid values are in the range 1–65535.
- ❑ **Logout on Discovery Session.** When this check box is selected, the QLA4010/4010C HBA initiates an iSCSI logout on a discovery session when discovery is complete (before closing the connection). When this check box is cleared, the QLA4010/4010C HBA closes the TCP connection when discovery is complete. This parameter is the same as Logout on iSCSI Discovery Session in the target parameters ([see section 6.5.3](#)).
- ❑ **Connection Keep Alive Timeout.** This column indicates the time interval (in seconds) between connection keep-alive *pings*. When a connection is idle for the connection keep-alive timeout interval, the QLA4010/4010C HBA sends an NOP ping to the other device that is part of the connection. When the device responds to the ping, the connection remains open. When the device fails to respond, the QLA4010/4010C HBA closes the connection and informs the driver that the connection has gone down. The maximum keep-alive time is 18 hours.

- ❑ **Ethernet Pause.** When this check box is selected, the QLA4010/4010C HBA accepts pause frames from a connected device. In addition, the QLA4010 HBA will issue an ethernet pause to momentarily stop incoming traffic when the SDRAM is almost full.
- ❑ **Header Digest.** When this check box is selected, iSCSI headers with CRC protection can be transmitted. In addition, incoming iSCSI headers are validated and the CRC protection removed.
- ❑ **Data Digest.** When this check box is selected, iSCSI data with CRC protection can be transmitted. In addition, incoming iSCSI data is validated and the CRC protection removed.
- ❑ **ARP Redirect.** When this check box is selected, MAC addresses are discovered and bound to IP addresses for hosts to which the QLA4010/4010C HBA wants to talk.
- ❑ **Error Recovery Level.** When this check box is selected, the QLA4010/4010C HBA supports iSCSI error recovery level 0. At this level, the QLA4010/4010C HBA closes a connection if it detects any errors.
- ❑ **Nagle.** When this check box is selected, the QLA4010/4010C HBA supports the Nagle algorithm. Therefore, when a TCP connection has outstanding data that has not been acknowledged (ACKed), small data segments cannot be sent until the ACKs arrive. These data segments are collected by TCP and sent in a single segment when the ACKs arrive. This feature helps control congestion.
- ❑ **TCP Timestamp.** When this check box is selected, a timestamp is placed in every transmitted TCP segment. When the receiver responds with an acknowledge (ACK), the timestamp is included. Consequently, the transmitter can calculate the round trip time (RTT) of the ACK. This value is used in calculating retransmissions (if necessary). When this check box is not selected, RTT can only be calculated on one outstanding segment at a time (rather than on each segment).
- ❑ **Strict iSCSI Login.** When this check box is selected, the QLA4010/4010C HBA adheres to the iSCSI login rules, and therefore cannot operate with devices that do not conform to these rules. When this check box is not selected, the iSCSI login rules are relaxed, and the QLA4010/4010C HBA can operate with devices that do not conform to these rules.

6.6.2

Restoring the Factory Defaults

Perform the following steps to reset the firmware parameters to the factory defaults:

1. Click the desired adapter in the HBA tree. By default, the **HBA Options** tabbed page displays.
2. Click the **Firmware** tab.
3. Click **Restore Factory Defaults**. The defaults are displayed in the firmware parameters table (see figure 6-26).

6.6.3

Firmware Upgrade

If you are receiving a QLA4010/4010C HBA for the first time, the current version of firmware is already loaded.

If you are upgrading a QLA4010/4010C HBA, follow the instructions in this section to load the latest firmware from the QLogic web site. The **HBA Information** tab in SANsurfer Control iX displays the firmware version you are using.

To upgrade the firmware, follow these steps:

1. Locate the iSCSI firmware on the QLogic web site (www.qlogic.com) and click **Download**.
2. When prompted **Would you like to open the file or save it to your computer?**, click the **Save** button. Specify a temporary location on the hard disk and download the file.
3. In the temporary directory, locate the file, qla4000fwxx.exe. Double-click the file to extract it to a specified directory.
4. Start SANsurfer Control iX: click **Start**, select **Programs**, select the install group (the default is **QLogic Corporation**), then click **SANsurfer Control iX**.
5. Select your HBA.
6. Click the **HBA Options** tab.
7. Click the **Firmware** tab.
8. Click the **Select Firmware to Download** button.

9. The **Firmware Download Warnings** dialog box displays (see figure 6-29). Click **Yes** to continue.

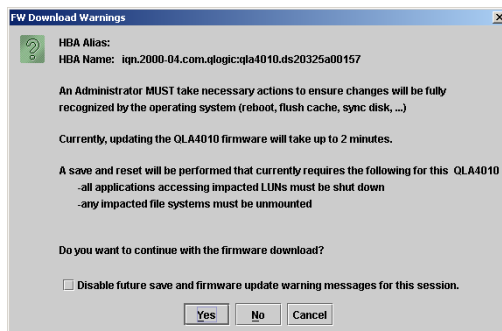


Figure 6-29. Firmware Download Warnings Dialog Box

10. You are prompted to enter your password. (see figure 6-30). Click **OK** to continue.



Figure 6-30. Security Check Dialog Box

11. The **FW Download Delay** dialog box displays (see figure 6-31). If you want to proceed, click **Yes**. Otherwise, click **No**.

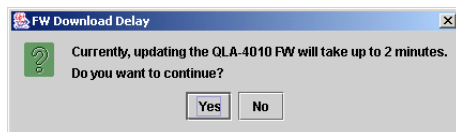


Figure 6-31. FW Download Delay Dialog Box

12. When the **Download Firmware** dialog box displays, click **Browse**.

13. The **Open** dialog box displays. Select the firmware file (downloaded in [step 2](#)), then click **Open** (see [figure 6-32](#)).

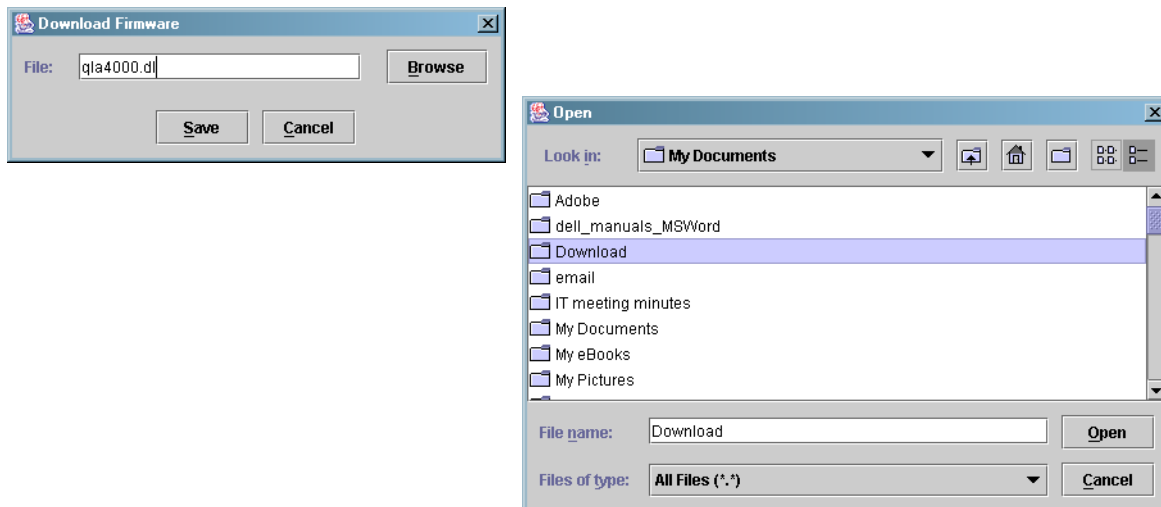


Figure 6-32. Update Firmware Dialog Boxes

14. The file name displays in the **Download Firmware** dialog box. Click **Save**.
15. Follow the instructions to reset the QLA4010/4010C HBA.
16. Restart the host PC for the operating system to recognize the new firmware.

6.6.4

Updating the ROM

Contact QLogic technical support for assistance when updating the ROM.

6.6.5

Viewing the HBA Crash Record

If the firmware crashes, perform the following steps to save the log information to a file:

1. Click the desired adapter in the HBA tree. By default, the **HBA Options** tabbed page displays with the **Firmware** tab displayed.
2. Click **Retrieve Crash Record**.

3. The **Save Crash Record** dialog box displays (see figure 6-33).

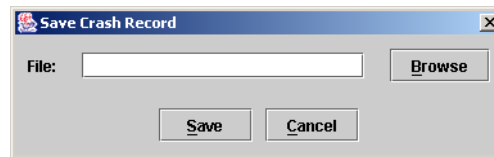


Figure 6-33. Save Crash Record Dialog Box

4. Enter a name and location for the crash file. If you do not know the location, click **Browse** to display a file selection dialog. Select or create the file. The **Save Crash Record** dialog box re-displays.
5. Click **Save**. The crash file will be in saved. Send this file to QLogic technical support.

6.7

Performing Diagnostics

6.7.1

Pinging a Target

Perform the following steps to *ping* a target:

1. Select an HBA in the HBA tree.
2. Click the **Diagnostics** tabbed page.
3. Click the **Ping** tab.
4. Enter an address in the IP fields. The IP addresses can be viewed on the **Target Settings** tabbed page.
5. In the **Number of Packets** field, enter the number of packets you would like send. Valid values are in the range 1–10000. The default is 1.
6. Click **Start Testing**. The packet being sent is displayed in the bottom left-hand side of the screen. When the test is complete, the **Ping Status** dialog box displays (see figure 6-34).

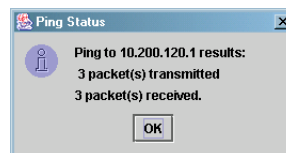


Figure 6-34. Ping Status Dialog Box

6.7.2

Viewing the ARP and Connection Error Tables

Perform the following steps to view the address resolution protocol (ARP) and connection error tables:

1. Select an HBA in the HBA tree.
2. Click the **Logs** tab.
3. Click **Display ARP Table** or **Display Connection Errors**, as appropriate. For a detailed list of connection errors, see the *ISP4010 Firmware Interface Specification*, part number 83410-660-00.